continues to provide a valid signal to determine the power distribution. This changes the CTS by allowing an action that is not contained in the CTS.

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The allowance provided by Required Action D.2.2 Note, "Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable," assumes Power Range function for determining QPTR remains OPERABLE. The Power Range function for determining QPTR is assumed inoperable in all cases in the CTS. This is not true of the ITS allowances. The Power Range channel may continue to provide the required signal for QPTR calculations on a loss of indication from the channel. If the portion of the Power Range channel input to QPTR is not OPERABLE, a flux map using the incore system must be performed. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

RAI 3.3.1-29 RS

L.4 *(Category 4 – Relaxation of Required Action)* CTS 3.3.1.1 Functional Unit 5, Neutron Flux Intermediate Range channels, in Table 3.3-1 states the Applicability for the instruments as Modes 1[###] and 2. The [###] requires the channels to be OPERABLE, "Below the P-10 (Power Range Neutron Flux) setpoint." If a channel becomes inoperable, Action 3 must be entered. CTS Action 3.b states with an inoperable Intermediate Range channel above P-6 but below P-10 restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-10 setpoint. CTS Action 3.c allows continued operation with an inoperable Intermediate Range channel if THERMAL POWER is greater than P-10. ITS 3.3.1 Function 4 Intermediate Range Neutron Flux in Table 3.3.1-1 lists the Applicable Modes or other specified conditions as MODE 1[(b)] and 2[(c)]. The superscript letters for the MODES denote the specified conditions. The Intermediate Range channels are required to be OPERABLE whenever reactor power is between MODE 2[(c)] (Intermediate Range Neutron Flux interlock, P-6) and MODE 1[(b)] (the Power Range Neutron Flux interlock, P-10). If an Intermediate Range channel becomes inoperable when reactor power is between P-6 and P-10, either ITS Required Actions F.1 or F.2 must be met. Required Action F.1 states that THERMAL POWER must be reduced to < P-6 within 24 hours. Required Action F.2 requires that THERMAL POWER be increased to > P-10 within 24 hours. This changes the CTS by allowing the reactor power to be increased to > P-10 (approximately 10% RTP) with an inoperable Intermediate Range channel with reactor power above the P-6 setpoint. This also changes the MODES of Applicability from MODE 1 [###] and 2 to specific values of the Power Range and Intermediate Range interlocks (P-10 and P-6).

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-30 ITS
STS
CTS
DOC L.5

NRC RAI: Comment: Add discussion to DOC L.5 providing a comparison of actions required by CTS to the actions proposed in ITS Condition G.

Response: The Company agrees with the Comment. DOC L.5 has been modified to justify the proposed change.

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. Above P-10, the Power Range channels provide the required protection, and below P-6, the Source Range channels provide the necessary protection function. Two hours is a reasonable period of time to allow for a slow and controlled power adjustment, with the OPERABLE Intermediate Range channel continuing to provide the required protection. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.5 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 Functional Unit 5 Neutron Flux Intermediate Range channels states if a channel becomes inoperable Action 3 must be entered. CTS Action 3.a states that when below P-6 restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint. CTS Action 3.b states with an inoperable Intermediate Range channel above P-6 but below P-10 restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above P-10. No allowance is provided for two inoperable channels, therefore LCO 3.0.3 must be entered in this condition. ITS Table 3.3.1–1 Function 4 Intermediate Range Neutron Flux states that Action G must be entered for two inoperable channels. ITS Action G states, "Two Intermediate Range channels inoperable," Required Actions G.1 and G.2 must be completed. Required Action G.1 states, "Suspend operations involving positive reactivity additions." Required Action G.2 states, "Reduce THERMAL POWER < P-6," within 2 hours. A Note modifies the Required Actions that states "Limited plant cooldown or boron dilution is allowed provided the change is accounted for in the calculated SDM." This changes the CTS by allowing Required Actions with two Intermediate Range channels inoperable that are not currently allowed.

RAI 3.3.1-30 R5

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The proposed Action precludes a power level increase and allows a reasonable period of time for a slow and controlled power adjustment with no Intermediate Range channels OPERABLE status. The Intermediate Range channels provide the necessary redundant protection feature to transition from the Source Range channels to the Power Range channels for a reactor

RAI 3.3.1-30 R5

start up. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.6 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1 lists for the Power Range Low Setpoint and Intermediate Range channels, the surveillance requirements for a CHANNEL FUNCTIONAL TEST (CFT). The Frequency of the CFT for these functions is S/U [(1)]. S/U requires the surveillance must be performed prior to a reactor startup. Note [(1)] states, "If not performed in previous 31 days." The Source and Intermediate Ranges additionally require a quarterly test to be performed (Q [(12)]). Note [(12)] states, "Quarterly Surveillance in MODE 3*, 4*, and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." The movement of the phrase, "by observation of the permissive annunciator window," is addressed by DOC LA.6. The deletion of quarterly surveillance in MODES 3*, 4*, and 5* is addressed by DOC L.10. The movement of the verification of Permissives P-6 and P-10 is addressed by DOC A.29. ITS SR 3.3.1.8 for the Source, Intermediate, and Power Range Neutron Flux Low Setpoint channels require a CHANNEL OPERATIONAL TEST (COT) to be performed every 92 days. Additionally, a COT must be performed for these instrument channels prior to reactor startup if not performed within the previous 31 days. The COT must be performed for the Source Range within 4 hours after reducing power below the P-6 setpoint and the Power Range Low Setpoint and Intermediate Range channels must perform the COT within 12 hours after power is reduced below the P–10 setpoint. This changes the CTS by allowing 4 hours for the Source Range and 12 hours for the Power and Intermediate Ranges to perform the required test after entry into the applicable MODES or other specified conditions.

RAI 3.3.1-31 R5

The purpose of ITS SR Frequency allowances is to provide a reasonable period of time that the SR may be performed on the required instrumentation channels upon entering the MODE of applicability. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The Power Range Low Setpoint, Intermediate and Source Ranges through operating experience have shown to be reliable and usually satisfy the surveillance requirements. These instruments will continue to be tested at a frequency to ensure channel OPERABILITY. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.7 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* Unit 2 CTS surveillance requirements for the Power Range Neutron Flux High Setpoint are listed in Table 4.3-1. This requires the D [(2)] CHANNEL CALIBRATION test to be performed on the instrumentation channels. Note (2) states, "Heat balance only, above 15 % of RATED THERMAL POWER. Adjust channel if absolute difference > 2 percent." ITS SR 3.3.1.2 is required for the Power Range Neutron Flux High Setpoint every 24 hours. The SR is modified by Note 2 that states, "Adjust NIS channel if

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-31 ITS
STS
CTS
DOC L.6

NRC RAI:
Comment #1 - PRNF channels (low setpoint) do not require a quarterly CFT as discussed above.

Comment #2 - DOC L.6 states "This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability." Provide documentation to show the specific results from the evaluation for the surveillance test extensions, the 4-hour completion time allowance to perform Source Range Neutron Monitor COT, and the 12-hour completion time allowance to perform the Intermediate Range Neutron Monitor COT.

Comment #3 - Provide DOC discussion to justify the Intermediate Range Q (12) CTS test deletions.

Comment #4 - Provide DOC discussions to justify the SR 3.3.1.8 requirement to include verification that interlocks P-6 and P-10 are in their required states.

Response:

The Company agrees with Comment 1. DOC L.6 has been modified to delete the reference to Low setpoint quarterly CFT testing.

In response to Comment 2, the following is provided. NUREG–1431 allows 4 hours for the source range and in the Bases for SR 3.3.1.8 states the following, ". . allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance." The change to the NUREG –1431 as documented in approved TSTF – 242 provides the justification for the change from 4 to 12 hours for the power and intermediate range channels as, "A review of plant work history (including performance and verification) revealed that COTs on the power range and intermediate range instrumentation require 1 to 2 hours per channel. This is consistent with the source range COT time allowance in SR 3.3.1.8, as 4 hours is given for a 2 channel system. However, the power range and intermediate range COTs consists of 6 channels and 4 hours isn't sufficient time to perform these COTs in a quality manner. Therefore, the time to perform these COTs is extended to 12 hours (2 hours per channel) to be consistent with the source range time allowance of 4 hours for 2 channels."

The Company agrees with Comment 3. DOC L.6 has been modified to state that DOC L.10 address the justification to delete the IRNF required testing.

The Company agrees with Comment 4. DOC L.6 has been modified to address the SR 3.3.1.8 requirement to verify that interlocks P-6 and P-10 are in their required states.

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

In addition to the Comments listed above, the Company has removed the allowance of performing the required testing within 92 days of a reactor startup and returned to the CTS requirement of performing the surveillance within 31 days of a reactor startup. This should remove this change from the beyond scope classification.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.1.7	----------NOTE---------- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. ---------- Perform COT.	92 days
SR 3.3.1.8	----------NOTE---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	-----NOTE----- Only required when not performed within previous 31 days ---------- Prior to reactor startup AND Four hours after reducing power below P-6 for source range instrumentation AND Twelve hours after reducing power below P-10 for power and intermediate instrumentation AND Once per 92 days thereafter

RAI 3.3.1-31 3.3.1-33 R5

R5

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The nominal trip setpoints must be within the Allowable Values specified in Table 3.3.1-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

SR 3.3.1.7 is modified by a Note that provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3.

The Frequency of 92 days is justified in Reference 7.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 31 days of the

(continued)

RAI 3.3.1-31 3.3.1-33 R5

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	----------NOTE---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ----------	
Channel Functional Test	Perform COT.	-----NOTE----- Only required when not performed within previous ~~92~~ 120 days ---------- 31 Prior to reactor startup AND Twelve ~~Four~~ hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation AND Once per ~~Every~~ 92 days thereafter

RAI 3.3.1-31 3.3.1-33 R5 (7) | J

TSTF 242

(2) | R5

(continued)

Rev. 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. <INSERT 1> TSTF 205

The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within (31) (92) days of the Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. (1) RAI 3.3.1-31 3.3.1-33 R5 The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "(4) hours after reducing power below P-10" (applicable to intermediate and power range low channels) (12) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the ~~plant~~ unit (2) TSTF 242 remains in the MODE of Applicability after the initial twelve and performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of respectively Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be for more than 12 hours maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed time prior to the expiration of the ~~4 hour~~ limit. Four hours (18) are (8) reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods >4 hours. Twelve hours and 12 and respectively

<INSERT 2> (5) R5

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every (92) days, as justified in Reference 7. (10) <INSERT 3> TSTF 205 R5

(continued)

Rev 5

ITS

TABLE 4.3-1 (Continued)

NOTATION

* – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. (A.5)

*** – Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint. (A.5)

(1) – If not performed in previous 31 days. (RAI 3.3.1-33 RS) (A.25)

(2) – Heat balance only, above 15% of RATED THERMAL POWER. (L.15)
<INSERT PROPOSED NOTE>

(3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. (L.9)
Adjust channel if absolute difference ≥ 3 percent. <INSERT proposed note>

(4) – Manual ESF functional input check every 18 months. (A.14)

(5) – Each train or logic channel shall be tested at least every 62 (31) days on a STAGGERED TEST BASIS. (A.23)

(6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) – Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint. (A.5)

(8) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s). (A.11) (LA.4)

(9) – Local manual shunt trip the reactor trip bypass breaker immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or reactor trip breaker maintenance. (LA.12)

(10) – Automatic undervoltage trip. (LA.4)

(11) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers. (A.11) (LA.4) (RAI 3.3.1-31 RS)

(12) – Quarterly Surveillance in Modes 3*, 4* and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. (L.10) (A.29) (LA.6)

(13) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1. (LA.13) (M.8)

(L.24) (RAI 3.3.1-10 RS)

<INSERT proposed Note>

Note SR 3.3.1.8 SR 3.3.1.15
Note SR 3.3.1.2
Note SR 3.3.1.3
Note SR 3.3.1.14
Frequency SR 3.3.1.4 SR 3.3.1.5
Note SR 3.3.1.11
TADOT
TADOT
SR 3.3.1.8 Note SR 3.3.1.8
SR 3.3.1.7 Note

TABLE 4.3-1 (CONTINUED)

ITS

NOTATION

* – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. A.5

*** – Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint. A.5

(1) – If not performed in previous 31 days. RAI 3.3.1-33 R5 A.25

Note SR 3.3.1.8 SR 3.3.1.15 Note SR 3.3.1.2

(2) – Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference ≤ 2 percent. <INSERT PROPOSED NOTE> L.7 L.15

Note SR 3.3.1.3

(3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. Recalibrate if absolute difference ≥ 3 percent. <INSERT PROPOSED Note> L.9

Note SR 3.3.1.14

(4) – Manual ESF functional input check every 18 months. A.14

FREQUENCY SR 3.3.1.4 SR 3.3.1.5 NOTE SR 3.3.1.11

(5) – Each train or logic channel shall be tested at least every 62 (31) days on a STAGGERED TEST BASIS. A.23

(6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) – Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint. A.5

TADOT

(8) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s). A.11 LA.4

(9) – Local manual shunt trip the reactor trip bypass breaker immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or reactor trip breaker maintenance. LA.12

(10) – Automatic undervoltage trip. LA.4

TADOT

(11) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers. A.11 LA.4

RAI 3.3.1-31 R5

SR 3.3.1.8 Note SR 3.3.1.8

(12) – Quarterly Surveillance in Modes 3*, 4* and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. L.10 A.29 LA.6

(13) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1. LA.13 M.8

SR 3.3.1.7 Note

<INSERT Proposed Note> L.24 RAI 3.3.1-10 R5

if absolute difference ≥ 3 percent." The CTS does not specify a CHANNEL CALIBRATION for the Overtemperature (OT)ΔT function. ITS Table 3.3.1–1 specifies SR 3.3.1.3 for PRNF and OTΔT functions. SR 3.3.1.3 states, " Compare results of the incore detector measurements to NIS AFD," every 31 effective full power days (EFPD). Two Notes modify the SR. Note 1 states, "Adjust NIS channel if absolute difference is ≥ 3 %." Note 2 states, "Not required to be performed until 24 hours after THERMAL POWER is ≥ 15 % RTP." The addition of Note 2 is addressed by DOC L.9. The change from monthly to every 31 EFPD is addressed by DOC L.16. This changes the CTS by applying the requirement of a monthly comparison of axial offset of the NIS channel to both the PRNF and OTΔT functions.

RAI 3.3.1-32 R5

The purpose of CTS monthly CHANNEL CALIBRATION for the PRNF channels is to ensure the indicated ΔI signal from the Power Range channels for the OTΔT channels are within 3% of the actual ΔI. This change is acceptable because the technical requirements of the CTS are translated into the appropriate ITS requirements. The monthly calibration of the PRNF channels is to ensure the PRNF properly reflect AFD indications and OTΔT channels receive appropriate adjustments to change their setpoints for changing plant conditions of ΔI. This change is designated as administrative because it does not result in technical changes to the CTS.

A.29 CTS Table 4.3-1 lists for the Power Range Low Setpoint and Intermediate Range channels a quarterly test to be performed (Q [12]). Note [12] states, "Quarterly Surveillance in MODE 3*, 4*, and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." ITS SR 3.3.1.8 for the Source, Intermediate, and Power Range Neutron Flux Low Setpoint channels require a CHANNEL OPERATIONAL TEST (COT) to be performed every 92 days. A Note modifies the SR that states, "This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions." The movement of the phrase, "by observation of the permissive annunciator window," is addressed by DOC LA.6. The deletion of quarterly surveillance in MODES 3*, 4*, and 5* is addressed by DOC L.10. This changes the CTS by reformatting the requirement to the ITS SR 3.3.1.8 Note.

RAI 3.3.1-31 R5

The purpose of ITS SR 3.3.1.8 Note is to ensure the interlocks P-6 and P-10 are in the proper state for the indicated power level from the appropriate NIS channels. This change is acceptable because the technical requirements of the CTS are maintained in ITS format. The CTS and ITS require the verification of P-6 and P-10 interlocks are in the required state for existing plant conditions. This change is designated as administrative because it does not result in technical changes to the CTS.

RAI 3.3.1-30 R5

start up. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.6 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1 lists for the Power Range Low Setpoint and Intermediate Range channels, the surveillance requirements for a CHANNEL FUNCTIONAL TEST (CFT). The Frequency of the CFT for these functions is S/U [(1)]. S/U requires the surveillance must be performed prior to a reactor startup. Note [(1)] states, "If not performed in previous 31 days." The Source and Intermediate Ranges additionally require a quarterly test to be performed (Q [(12)]). Note [(12)] states, "Quarterly Surveillance in MODE 3*, 4*, and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." The movement of the phrase, "by observation of the permissive annunciator window," is addressed by DOC LA.6. The deletion of quarterly surveillance in MODES 3*, 4*, and 5* is addressed by DOC L.10. The movement of the verification of Permissives P-6 and P-10 is addressed by DOC A.29. ITS SR 3.3.1.8 for the Source, Intermediate, and Power Range Neutron Flux Low Setpoint channels require a CHANNEL OPERATIONAL TEST (COT) to be performed every 92 days. Additionally, a COT must be performed for these instrument channels prior to reactor startup if not performed within the previous 31 days. The COT must be performed for the Source Range within 4 hours after reducing power below the P-6 setpoint and the Power Range Low Setpoint and Intermediate Range channels must perform the COT within 12 hours after power is reduced below the P–10 setpoint. This changes the CTS by allowing 4 hours for the Source Range and 12 hours for the Power and Intermediate Ranges to perform the required test after entry into the applicable MODES or other specified conditions.

RAI 3.3.1-31 R5

The purpose of ITS SR Frequency allowances is to provide a reasonable period of time that the SR may be performed on the required instrumentation channels upon entering the MODE of applicability. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The Power Range Low Setpoint, Intermediate and Source Ranges through operating experience have shown to be reliable and usually satisfy the surveillance requirements. These instruments will continue to be tested at a frequency to ensure channel OPERABILITY. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.7 *(Category 6 – Relaxation of Surveillance Requirement Acceptance Criteria)* Unit 2 CTS surveillance requirements for the Power Range Neutron Flux High Setpoint are listed in Table 4.3-1. This requires the D [(2)] CHANNEL CALIBRATION test to be performed on the instrumentation channels. Note (2) states, "Heat balance only, above 15 % of RATED THERMAL POWER. Adjust channel if absolute difference > 2 percent." ITS SR 3.3.1.2 is required for the Power Range Neutron Flux High Setpoint every 24 hours. The SR is modified by Note 2 that states, "Adjust NIS channel if

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-32 ITS
STS
CTS
DOC L.9

NRC RAI:

Comment#1- There is an apparent mismatch between the CTS markup and the ITS. ITS SR 3.3.1.3 only applies to OT DT; it is not applicable to PRNF.

Comment #2 - The CTS reference above to the M (3) CHANNEL CALIBRATION is only applicable to PRNF, but not OT DT. The addition of SR 3.3.1.3, "Compare the results of the incore detector measurements of NIS AFD." to OTDT is not evaluated by DOC L.9.

Comment #3 - For M [(3)] CTS changes, M to D frequencies and 3% to 2% are not evaluated by DOC L.9.

Comment #4 M(6) not Q(6) applies to PRNF in CTS Table 4.3-1. The deletion of the monthly PRNF channel calibration is not evaluated.

Comment #5 - DOC L.9 justifies changes as, "The allowance of 24 hours after exceeding 15 % RTP is a reasonable period of time during a plant start up. The transient nature of returning the plant to full power and performing the required testing requires the plant to be in a steady state condition." What is the intended meaning? The same phrase is used in DOC L.15 to justify a 12-hour allowance vice a 24-hour allowance after exceeding 15% power as a reasonable time in which to perform the testing. Explain the basis for the proposed changes given the different completion times.

Response:

The Company agrees with Comment 1. CTS requires a CHANNEL CALIBRATION for the Power Range channels to be performed on a monthly basis (M [(3)(6)]). Note [(3)] states, "Compare incore to excore axial offset above 15 % of RATED THERMAL POWER. Adjust channel if absolute difference ≥ 3%." Note [(6)] states, "Neutron detectors may be excluded from CHANNEL CALIBRATION." This requirement is translated into ITS SR 3.3.1.3 and the only reactor trip function that requires the performance of this SR is the OTΔT function. The monthly CHANNEL CALIBRATION (ITS SR 3.3.1.3) needs to be added to the requirements for the PRNF. This is clarified in the CTS with the addition of DOC A.28 and the change in the ISTS is justified by JFD 17.

The Company agrees with Comments 2, 3, 4, and 5. DOC L.9 is modified to address these Comments by specifying that the change is only associated with the addition of Note 2 to the SR 3.3.1.3. Change of the requirements from the monthly PRNF to the 31 EFPD requirement of the OTΔT function is addressed by DOCs L.16 and A.28.

Table 3.3.1-1 (page 1 of 5)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Manual Reactor Trip	1, 2	2	B	SR 3.3.1.14	NA
	3(a), 4(a), 5(a)	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1, 2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.3 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110% RTP
b. Low	1(b), 2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 26% RTP
3. Power Range Neutron Flux Rate					
a. High Positive Rate	1, 2	4	E	SR 3.3.1.7 SR 3.3.1.11	≤ 5.5% RTP with time constant ≥ 2 sec
b. High Negative Rate	1, 2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 5.5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F, G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 40% RTP
5. Source Range Neutron Flux	2(d)	2	H, I	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 1.3 E5 cps
	3(a), 4(a), 5(a)	2	I, J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 1.3 E5 cps
	3(e), 4(e), 5(e)	1	K	SR 3.3.1.1 SR 3.3.1.11	NA

RAI 3.3.1-32 R5

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

(e) With the Rod Control System incapable of rod withdrawal. In this condition, source range Function does not provide reactor trip but does provide indication.

CTS TABLE 3.3-1

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT(a)	
1.	1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA	
		3(b), 4(b), 5(b) (a)	2	C	SR 3.3.1.14	NA	NA	
	2. Power Range Neutron Flux							RAI 3.3.1-32 R5
2	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110 (111.2)% RTP SR 3.3.1.3	≤ [109]% RTP	7, 17
NEW	b. Low (6)	1(b), 2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 26 (27.2)% RTP	≤ [25]% RTP	7
	3. Power Range Neutron Flux Rate							
3.	a. High Positive Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11	≤ 5.5 (6.8)% RTP with time constant ≥ (12) sec	≤ [5]% RTP with time constant ≥ [2] sec	7
4.	b. High Negative Rate	1,2	4	E	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 5.5 (6.8)% RTP with time constant ≥ 12 sec	≤ [5]% RTP with time constant ≥ [2] sec	7
5.	4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 40 (31)% RTP	≤ [25]% RTP	7
		2(e)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ [31]% RTP	≤ [25]% RTP	TSTF 135

(continued)

(a) Reviewer's Note: Unit specific implementations may contain only Allowable Value depending on Setpoint Study methodology used by the unit.

(a) (b) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) (c) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) (d) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(e) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

or one or more rods not fully inserted

TSTF 6
TSTF 135 6
6
TSTF 135

Rev. 0

13. References to RTS interlock P-9 are deleted. The North Anna design does not utilize this function, but uses the P-8 function to perform the same requirements. Function e. and f. have been re-lettered.

14. The Overtemperature ΔT and Overpower ΔT formulas of the ISTS Table 3.3.1-1 in Notes 1 and 2 have been modified to reflect the North Anna CTS requirements. These changes are acceptable because they reflect the CTS formulas in the ITS requirements for these functions. Values for the notes, such as τ_4, τ_5, τ_6, and τ_7 that are not needed, are deleted.

15. ISTS SR 3.3.1.6 states that a calibration of excore channels is required to be performed to make the channels agree with the incore detector measurements. A CTS requirement to perform a CHANNEL CALIBRATION on a quarterly basis for the Power Range channels would have been translated into this ITS requirement. The quarterly CHANNEL CALIBRATION for the Power Range channels was required before it was deleted by a Technical Specification change #221 for Unit 1 and #202 for Unit 2 (TAC #s MA5448 and MA 5450) dated March 9, 2000. A letter dated December 16, 1999 proposed the deletion of the requirement. The safety evaluation for the TS change states, "The specific TS changes and the licensee's justification are listed in the licensee's submittal dated May 6, 1999, Attachment 1 (Pages 9 through 17) and Attachment 2, as supplemented June 22 and December 16, 1999. The staff has reviewed all these changes based on the generic evaluation provided earlier and finds them acceptable." ITS SR 3.3.1.6 requires a comparison of the results of the incore detector measurement and the excore channels. Note 1 to the SR states, "Adjust NIS channel if absolute difference is ≥ 3%." This change is acceptable because the results of the incore measurements to excore channels will cause the NIS channels for the f (ΔI) input to the OTΔT function to be readjusted if the difference is 3% or more. Note 1 is added to prevent unnecessary recalibration when the difference between the NIS channels and incore measurements is small and less than 3% between the actual and indicated values.

RAI 3.3.1-39 R5

16. The CHANNEL OPERATIONAL TEST (COT) and the CHANNEL CALIBRATION apply to the P–10 and P–13 inputs, not the P–7 logic function. Logic functions are tested under SR 3.3.1.5. This change is an administrative clarification to address the relationship between these interlocks. This change is consistent with proposed change TSTF–347.

RAI 3.3.1-05 R5

17. ISTS Table 3.3.1-1 Function 2.A, Power Range Neutron Flux High, does not specify a monthly CHANNEL CALIBRATION to be performed. ITS SR 3.3.1.3 is added to the Power Range Neutron Flux High requirements. This requires a comparison of incore to excore indication of AFD every 31 EFPD. An adjustment of the NIS channels is required if absolute difference is ≥ 3%. The SR is not required to be performed until 24 hours after THERMAL POWER exceeds 15 % RTP. This change is acceptable because all PRNF channels provide inputs for determining QPTR that require accurate AFD indications.

RAI 3.3.1-32 R5

A.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	Response Time Test
1	1. Manual Reactor Trip	N.A.	N.A.	R(8) LA.4	1, 2 and *	N/A L.20
2	2. Power Range, Neutron Flux		L.15 3.3.1.2 3.3.1.3 L.9 L.16 D(2)(6), M(3)(6) and R(6) A.1 3.3.1.11	3.3.1.14 A.11 A.28	1, 2	3.3.1.16 RAI 3.3.1-32 R5
2a	A. High Setpoint	A.1 3.3.1.1 (8)		Q 3.3.1.7 A.11		
2b	B. Low Setpoint	A.1 3.3.1.1 (8)	R(6) 3.3.1.11 A.1	S/U(1)(11) 3.3.1.8 L.6	1***, 2	3.3.1.16
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(6) 3.3.1.11 A.1	Q 3.3.1.7 A.11	1, 2	N/A L.20
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.	R(6) 3.3.1.11	Q 3.3.1.7 A.11	1, 2	3.3.1.16
4	5. Intermediate Range, Neutron Flux	A.1 3.3.1.1 (8) a. b. Q(12) A.10	M.8 LA.13 R(6) (A) 3.3.1.11 N.A.	S/U(1), Q(12) 3.3.1.8 L.6 N.A. L.17	1***, 2 3*, 4*, 5*	N/A L.20
5	6. Source Range, Neutron Flux	A.1 3.3.1.1 (8) (A) A.5	A.1 R(6) 3.3.1.11	3.3.1.7 3.3.1.8 S/U(1), Q(12) L.10	2, 3, 4, 5	3.3.1.16 RAI 3.3.1-35 R5
6	7. Overtemperature ΔT	A.1 3.3.1.1 (8)	A.1 R(6) 3.3.1.12	M.13 3.3.1.6 A.28 Q 3.3.1.7 3.3.1.5 A.11 L.9 L.16	1, 2	3.3.1.16
7	8. Overpower ΔT	A.1 3.3.1.1 (8)	A.1 R(6) 3.3.1.12	Q 3.3.1.7 A.11	1, 2	N/A L.20
8a	9. Pressurizer Pressure – Low	A.1 3.3.1.1 (8)	A.1 R 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16 RAI 3.3.1-39 R5
8b	10. Pressurizer Pressure – High	A.1 3.3.1.1 (8)	A.1 R 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
9	11. Pressurizer Water Level – High	A.1 3.3.1.1 (8)	A.1 R 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
10	12. Loss of Flow	A.1 3.3.1.1 (8)	A.1 R 3.3.1.10	Q 3.3.1.7 A.11	1	3.3.1.16

A.5 A.7 A.11 Cor TADOT

RAI 3.3.1-32

ITS 3.3.1

Rev. 5

Page 13 of 22

A.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST (A.11)	MODES IN WHICH SURVEILLANCE REQUIRED (A.5)	Response Time Test (A.7)
1	1. Manual Reactor Trip	N.A.	N.A.	R (3.3.1.14) LA (A.11)	1, 2 and *	N/A — L.20
2	2. Power Range, Neutron Flux					
2a	A. High Setpoint	A.1 — 3.3.1.1 (8)	D (2)(6) M (3)(6) and R (3.3.1.11) A.1 — L.16 — 3.3.1.3 — L.15 L.7 L.9 A28	Q (3.3.1.7) A.11	1, 2	3.3.1.16 — RAI 3.3.1-32 R5
2b	B. Low Setpoint	A.1 — 3.3.1.1 (8)	R (3.3.1.11) A.1	S/U (1) R (3.3.1.8) L.6	1***, 2	3.3.1.16
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.	R (3.3.1.11) A.1	Q (3.3.1.7) A.11	1, 2	N/A — L.20
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.	R (3.3.1.11) A.1	Q (3.3.1.7) A.11	1, 2	3.3.1.16
4	5. Intermediate Range, Neutron Flux	3.3.1.1 A.1 (R) a. b. Q (1)(4) A.10	M (3) R (3.3.1.11) LA.13 N.A.	S/U (1) Q (12) (3.3.1.8) L.6 N.A.	1***, 2 3*, 4*, 5*	N/A — L.20
5	6. Source Neutron Flux	3.3.1.1 A.1 (S) A.5	R (3.3.1.11) A.1	S/U (1) Q (12) (3.3.1.8) L.10	2, 3, 4, 5	3.3.1.16 — RAI 3.3.1-35 R5
6	7. Overtemperature ΔT	3.3.1.1 A.1 (8)	R (3.3.1.12) A.1 M.13	Q (3.3.1.7) A.11 — 3.3.1.6 — A.28 — 3.3.1.3 L.16	1, 2	3.3.1.16 — RAI 3.3.1-39 R5
7	8. Overpower ΔT	3.3.1.1 A.1 (8)	R (3.3.1.12) A.1	Q (3.3.1.7) A.11 L.9	1, 2	N/A — L.20
8a	9. Pressurizer Pressure – Low	3.3.1.1 A.1 (8)	R (3.3.1.10) A.1	Q (3.3.1.7) A.11	1, 2	3.3.1.16
8b	10 Pressurizer Pressure – High	3.3.1.1 A.1 (8)	R (3.3.1.10) A.1	Q (3.3.1.7) A.11	1, 2	3.3.1.16
9	11. Pressurizer Water Level – High	3.3.1.1 A.1 (8)	R (3.3.1.10) A.11	Q (3.3.1.7) A.11	1, 2	3.3.1.16
10	12. Loss of Flow	3.3.1.1 A.1 (8)	R (3.3.1.10) A.1	Q (3.3.1.7) A.11	1	3.3.1.16

RAI 3.3.1-32

ITS 3.3.1

03-09-00

Rev 5

requirement, but is provided for clarification. This change is designated as administrative because it does not result in technical changes to the CTS.

RAI 3.3.1-17 R5

A.26 CTS Table 3.3-1 Action 1 states with the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement the unit must be shutdown within a given time. Additionally, Action 1 states that one channel may be bypassed for up to 4 hours for concurrent surveillance testing of the RTB and automatic trip logic provided the other channel is OPERABLE. Action 1 applies to Function 21 Reactor Trip Breakers. ITS Table 3.3.1 –1 for function 19 requires Condition P to be entered for an inoperable train. Condition P requires with one RTB train inoperable, it must be restored to OPERABLE status or the unit must be shutdown. Three Notes modify Condition P. Note 3 states that one RTB train may be bypassed for up to 4 hours for concurrent surveillance testing of the RTB and automatic trip logic, provided the other channel is OPERABLE. This changes the CTS by placing the allowance of concurrent surveillance testing into a Note in the ITS format.

RAI 3.3.1-02 3.3.1-18 R5

This change is acceptable because the allowance of the CTS is maintained in the ITS format. Four hours of concurrent surveillance testing of the RTB and automatic trip logic are allowed in the CTS requirements. The CTS allowance is justified by WCAP-14333 P-A. This change is designated as administrative because it does not result in a technical change to the CTS.

A.27 CTS Table 3.3-1 Function 20 RCP Breaker Position provides for a reactor trip. The total number of channels is one per (RCP) breaker and for an inoperable channel Action 8 must to be entered and requires the inoperable channel to be placed into trip within 72 hours or the unit is required to be placed below P-7 interlock within 78 hours. ITS 3.3.1 for RCP Breaker Position specifies the required channels is one per RCP (breaker) and requires Condition M for an inoperable channel. The Condition provides for an inoperable channel that the channel must be placed in trip within 72 hours or power must be reduced below P-7 setpoint within 78 hours. This changes the CTS by stating the channel requirement for RCP breaker position as one per RCP.

RAI 3.3.1-08 R5

The purpose of this change is to provide consistent requirements for the functions as assumed in the safety analyses assumptions. This change is acceptable because the required Reactor Trip function is specified to be OPERABLE in the applicable MODE with consistent required actions. The Condition is consistent with appropriate Required Action to place the unit out of the MODE of applicability within Completion Times consistent with other measures that shutdown the unit. This change is designated as administrative because it does not result in technical changes to the CTS.

A.28 CTS Table 4.3-1 lists the surveillance requirements for the Power Range Neutron Flux CHANNEL CALIBRATION as M (3)(6). Note (3) states, "Compare incore to excore axial offset above 15 % RATED THERMAL POWER (RTP). Adjust channel

RAI 3.3.1-32 R5

if absolute difference ≥ 3 percent." The CTS does not specify a CHANNEL CALIBRATION for the Overtemperature (OT)ΔT function. ITS Table 3.3.1–1 specifies SR 3.3.1.3 for PRNF and OTΔT functions. SR 3.3.1.3 states, " Compare results of the incore detector measurements to NIS AFD," every 31 effective full power days (EFPD). Two Notes modify the SR. Note 1 states, "Adjust NIS channel if absolute difference is ≥ 3 %." Note 2 states, "Not required to be performed until 24 hours after THERMAL POWER is ≥ 15 % RTP." The addition of Note 2 is addressed by DOC L.9. The change from monthly to every 31 EFPD is addressed by DOC L.16. This changes the CTS by applying the requirement of a monthly comparison of axial offset of the NIS channel to both the PRNF and OTΔT functions. RAI 3.3.1-32 R5

The purpose of CTS monthly CHANNEL CALIBRATION for the PRNF channels is to ensure the indicated ΔI signal from the Power Range channels for the OTΔT channels are within 3% of the actual ΔI. This change is acceptable because the technical requirements of the CTS are translated into the appropriate ITS requirements. The monthly calibration of the PRNF channels is to ensure the PRNF properly reflect AFD indications and OTΔT channels receive appropriate adjustments to change their setpoints for changing plant conditions of ΔI. This change is designated as administrative because it does not result in technical changes to the CTS.

A.29 CTS Table 4.3-1 lists for the Power Range Low Setpoint and Intermediate Range channels a quarterly test to be performed (Q [(12)]). Note [(12)] states, "Quarterly Surveillance in MODE 3*, 4*, and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." ITS SR 3.3.1.8 for the Source, Intermediate, and Power Range Neutron Flux Low Setpoint channels require a CHANNEL OPERATIONAL TEST (COT) to be performed every 92 days. A Note modifies the SR that states, "This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions." The movement of the phrase, "by observation of the permissive annunciator window," is addressed by DOC LA.6. The deletion of quarterly surveillance in MODES 3*, 4*, and 5* is addressed by DOC L.10. This changes the CTS by reformatting the requirement to the ITS SR 3.3.1.8 Note. RAI 3.3.1-31 R5

The purpose of ITS SR 3.3.1.8 Note is to ensure the interlocks P-6 and P-10 are in the proper state for the indicated power level from the appropriate NIS channels. This change is acceptable because the technical requirements of the CTS are maintained in ITS format. The CTS and ITS require the verification of P-6 and P-10 interlocks are in the required state for existing plant conditions. This change is designated as administrative because it does not result in technical changes to the CTS.

difference is greater than (-) 2%." This changes the CTS only requiring an adjustment of the Power Range channel if indicated power of the NIS channel is more than 2 % lower than the calculated power of the calorimetric.

This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. Operating experience has shown that adjustments of NIS channels down can create non-conservative trip setpoints for the Power Range channels. The elimination of the requirement to adjust the Power Range channels when they are above the calorimetric power is conservative. The decalibration of the Power Range channels usually occurs with adjustments at low power levels. The elimination of this portion of the requirement will preclude the decalibration of the channels. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.8 *(Category 1 – Relaxation of LCO Requirements)* CTS requirements for RTS interlocks (P-6, P-8, P-10, and P-13) provide specific numbers for the Allowable Values. The Allowable Values for the P-7 function come from the requirements of P-10 and P-13. ITS requirements for these functions are provided with appropriate $\geq$ or $\leq$ symbols to specifically state the limits for each RTS interlock value. This changes the CTS by allowing the values of the RTS interlocks to be set to a limit not currently allowed.

This change is acceptable because the LCO requirements continue to ensure that the process variables are maintained consistent with the safety analyses and licensing basis. The addition of the symbols provides for a conservative tolerance for the RTS interlock function in accordance with the safety analyses assumptions. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L.9 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table 4.3-1 lists the surveillance requirements for the Power Range Neutron Flux CHANNEL CALIBRATION as M [(3)(6)]. Note [(3)] states, "Compare incore to excore axial offset above 15 % RATED THERMAL POWER (RTP). Adjust channel if absolute difference $\geq$ 3 percent." ITS Table 3.3.1–1 specifies SR 3.3.1.3 for the Overtemperature ΔT function. SR 3.3.1.3 states, " Compare results of the incore detector measurements to NIS AFD," every 31 effective full power days (EFPD). Two Notes modify the SR. Note 1 states, "Adjust NIS channel if absolute difference is $\geq$ 3 %." Note 2 states, "Not required to be performed until 24 hours after THERMAL POWER is $\geq$ 15 % RTP." The change from monthly to every 31 EFPD is addressed by DOC L.16. This changes the CTS by allowing 24 hours to perform a CHANNEL CALIBRATION after THERMAL POWER exceeds 15 % RTP for the surveillance testing.

RAI 3.3.1-32 R5

The purpose of ITS SR 3.3.1.3 Note 2 is to state that the SR is only applicable above the 15 % RTP and to provide a reasonable period of time to perform the SR after exceeding the required power level. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The allowance of 24 hours after exceeding 15 % RTP is a reasonable period of time to perform the flux mapping and compare the result with the indicated AFD of the NIS channels. The incore to excore indication of ΔI below 15 % of RTP does not provide for accurate comparisons, therefore a limit of 15% is placed on the applicability of the SR. This change is designated as less restrictive because Surveillances can be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-32 RS

L.10 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1 list for the Power Range (Low Setpoint), Intermediate Range, and the Source Range channels S/U (1) requirements for a CHANNEL FUNCTIONAL TEST (CFT). This also requires the CFT be performed prior to a reactor start up if not completed within the previous 31 days (Note (1)). The Source and Intermediate Ranges additionally require Q (12) requirement. Note (12) states, "Quarterly Surveillance in Modes 3*, 4*, and 5* shall also include verification that Permissive P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." ITS SR 3.3.1.8 for the Source, Intermediate and Power Range Neutron Flux channels requires a COT be performed every 92 days. In addition, ITS SR 3.3.1.8 allows the COT to be performed within 12 hours after reducing power below P-10 for the Power and Intermediate ranges of instrumentation. The COT must be performed for the Source Range channels within 4 hours after reducing power below P-6. This changes the CTS by allowing Source Range channels to perform a COT within 4 hours after power is reduced below the P-6 and Intermediate and Power Ranges within 12 hours after power is reduced below P-10 setpoint.

This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. With the unit shutting down, the performance of the SRs prior to entering the applicable MODE would create a distraction for the operators from performing their primary function of operating the unit safety. The 4 hours for the Source Range and 12 hours for the Intermediate and Power Range channels are appropriate because of these instruments generally pass the required surveillance requirements. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-33 RS

L.11 Not used.

L.12 Not used.

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-33 ITS
STS
CTS
DOC L.11

NRC RAI: Comment: Provide a safety basis discussion for changing the SR to 92 days from 31 days.

Response: The Company withdraws the proposed change and deletes L.11. This changes SR 3.3.1.8 Frequency Note to read "31 days."

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.1.7	----------NOTE---------- Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. ---------- Perform COT.	92 days
SR 3.3.1.8	----------NOTE---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ---------- Perform COT.	-----NOTE----- Only required when not performed within previous 31 days ---------- Prior to reactor startup AND Four hours after reducing power below P-6 for source range instrumentation AND Twelve hours after reducing power below P-10 for power and intermediate instrumentation AND Once per 92 days thereafter

RAI 3.3.1-31 3.3.1-33 R5

R5

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The nominal trip setpoints must be within the Allowable Values specified in Table 3.3.1-1.

The difference between the current "as found" values and the previous test "as left" values must be consistent with the drift allowance used in the setpoint methodology. The setpoint shall be left set consistent with the assumptions of the current unit specific setpoint methodology.

The "as found" and "as left" values must also be recorded and reviewed for consistency with the assumptions of Reference 7.

SR 3.3.1.7 is modified by a Note that provides a 4 hour delay in the requirement to perform this Surveillance for source range instrumentation when entering MODE 3 from MODE 2. This Note allows a normal shutdown to proceed without a delay for testing in MODE 2 and for a short time in MODE 3 until the RTBs are open and SR 3.3.1.7 is no longer required to be performed. If the unit is to be in MODE 3 with the RTBs closed for > 4 hours this Surveillance must be performed prior to 4 hours after entry into MODE 3.

The Frequency of 92 days is justified in Reference 7.

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 31 days of the

(continued)

RAI 3.3.1-31 3.3.1-33 R5

CTS

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	----------NOTE---------- This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. ----------	
Channel Functional Test	Perform COT.	-----NOTE----- Only required when not performed within previous ~~92~~ 31 days ---------- Prior to reactor startup AND ~~Four~~ Twelve hours after reducing power below P-10 for power and intermediate instrumentation AND Four hours after reducing power below P-6 for source range instrumentation AND ~~Every~~ Once per 92 days thereafter

RAI 3.3.1-31 3.3.1-33 RS (7) J

TSTF 242

(2) RS

(continued)

Rev. 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. <INSERT 1> TSTF 205

The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 92 days of the Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 4 hours.

(31) (92) (1) RAI 3.3.1-31 3.3.1-33 R5 (12) TSTF 242 (2) unit twelve and respectively for more than 12 hours time are (18) Twelve hours and 12 and respectively INSERT 2 (5) R5

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7. (1) INSERT 3 TSTF 205 R5

(continued)

Rev 5

ITS

TABLE 4.3-1 (Continued)

NOTATION

* – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. A.5

*** – Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint. A.5 | RAI 3.3.1-33 RS A.25

(1) – If not performed in previous 31 days.

Note SR3.3.1.8 SR3.3.1.15 Note SR3.3.1.2 Note SR 3.3.1.3

(2) – Heat balance only, above 15% of RATED THERMAL POWER. L.15
<INSERT PROPOSED NOTE>

(3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. L.9
Adjust channel if absolute difference ≥ 3 percent. <INSERT PROPOSED NOTE>

Note SR 3.3.1.14

(4) – Manual ESF functional input check every 18 months. A.14

Frequency SR 3.3.1.4 SR3.3.1.5 Note SR3.3.1.11

(5) – Each train or logic channel shall be tested at least every 31 ~~62~~ days on a STAGGERED TEST BASIS. A.23

(6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) – ~~Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint.~~ A.5

TADOT

(8) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s). A.11 LA.4

(9) – Local manual shunt trip the reactor trip bypass breaker immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or reactor trip breaker maintenance. LA.12

(10) – Automatic undervoltage trip. LA.4

TADOT

(11) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers. A.11 LA.4 RAI 3.3.1-31 RS

SR3.3.1.8 Note SR3.3.1.8

(12) – Quarterly Surveillance in Modes 3*, 4* and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. L.10 A.29 LA.6

(13) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1. LA.13 M.8

SR 3.3.1.7 Note

<INSERT proposed Note> L.24 | RAI 3.3.1-10 RS

TABLE 4.3-1 (CONTINUED)

ITS

NOTATION

* – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal. A.5

*** – Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) setpoint. A.5

(1) – If not performed in previous 31 days. RAI 3.3.1-33 R5 A.25

Note SR 3.3.1.8 SR 3.3.1.15 Note SR 3.3.1.2

(2) – Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference ≥ 2 percent. <INSERT PROPOSED Note> L.7 L.15

Note SR 3.3.1.3

(3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. Recalibrate if absolute difference ≥ 3 percent. <INSERT PROPOSED Note> L.9

Note SR 3.3.1.14

(4) – Manual ESF functional input check every 18 months. A.14

FREQUENCY SR 3.3.1.4 SR 3.3.1.5 NOTE SR 3.3.1.11

(5) – Each train or logic channel shall be tested at least every 62 (31) days on a STAGGERED TEST BASIS. A.23

(6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.

(7) – Below the P-6 (Intermediate Range Neutron Flux Interlock) setpoint. A.5

TADOT

(8) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s). A.11 LA.4

(9) – Local manual shunt trip the reactor trip bypass breaker immediately after placing the bypass breaker into service, but prior to commencing reactor trip system testing or reactor trip breaker maintenance. LA.12

(10) – Automatic undervoltage trip. LA.4

TADOT

(11) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers. A.11 LA.4

RAI 3.3.1-31 R5

SR 3.3.1.8 Note SR 3.3.1.8

(12) – Quarterly Surveillance in Modes 3*, 4* and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window. L.10 A.29 LA.6

(13) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1. LA.13 M.8

SR 3.3.1.7 Note

<INSERT Proposed Note> L.24 RAI 3.3.1-10 R5

The purpose of ITS SR 3.3.1.3 Note 2 is to state that the SR is only applicable above the 15 % RTP and to provide a reasonable period of time to perform the SR after exceeding the required power level. This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The allowance of 24 hours after exceeding 15 % RTP is a reasonable period of time to perform the flux mapping and compare the result with the indicated AFD of the NIS channels. The incore to excore indication of ΔI below 15 % of RTP does not provide for accurate comparisons, therefore a limit of 15% is placed on the applicability of the SR. This change is designated as less restrictive because Surveillances can be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-32 RS

L.10 *(Category 7 – Relaxation Of Surveillance Frequency)* CTS Table 4.3-1 list for the Power Range (Low Setpoint), Intermediate Range, and the Source Range channels S/U (1) requirements for a CHANNEL FUNCTIONAL TEST (CFT). This also requires the CFT be performed prior to a reactor start up if not completed within the previous 31 days (Note (1)). The Source and Intermediate Ranges additionally require Q (12) requirement. Note (12) states, "Quarterly Surveillance in Modes 3*, 4*, and 5* shall also include verification that Permissive P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window." ITS SR 3.3.1.8 for the Source, Intermediate and Power Range Neutron Flux channels requires a COT be performed every 92 days. In addition, ITS SR 3.3.1.8 allows the COT to be performed within 12 hours after reducing power below P-10 for the Power and Intermediate ranges of instrumentation. The COT must be performed for the Source Range channels within 4 hours after reducing power below P-6. This changes the CTS by allowing Source Range channels to perform a COT within 4 hours after power is reduced below the P-6 and Intermediate and Power Ranges within 12 hours after power is reduced below P-10 setpoint.

This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. With the unit shutting down, the performance of the SRs prior to entering the applicable MODE would create a distraction for the operators from performing their primary function of operating the unit safety. The 4 hours for the Source Range and 12 hours for the Intermediate and Power Range channels are appropriate because of these instruments generally pass the required surveillance requirements. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-33 RS

L.11 Not used.

L.12 Not used.

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-34 ITS
STS
CTS
DOC L.16

NRC RAI:
Comment #1 - DOC L.16 discusses changes to PRNF and OTΔT trip functions. The statements in the first paragraph are not organized such that it is well understood which CTS change is being evaluated. ITS SRs 3.3.1.3 and 3.3.1.6 are referenced. These surveillances include NOTES which are not discussed. Provide evaluation for CTS changes that result from adopting the SR NOTES.

Comment #2 - Show that no CTS changes result from adopting EFPD units.

Comment #3 - The second sentence in the second paragraph is unclear.

Comment #4 - $Q^{(6)}$ CTS Channel Calibrations are changed in the ITS and these changes are not evaluated in DOC L.16.

Response:
The Company agrees with the Comments and DOC L.16 has been modified to address the changes.

not assumed by the safety analyses, but is an operational consideration. The P-13 interlock actuates to provide an input signal to the P-7 interlock. With power level increasing above 10 % RTP, the P-7 interlock initiates a permissive signal to the Reactor Trip System. This allows the functions to generate a trip signal for the specified conditions. This function is assumed to function by the safety analyses. P-6, P-8, and P-13 interlock functions for the directions indicated above, are not assumed to provide safety system protection signals in the safety analyses. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L.15 *(Category 7 – Relaxation of Surveillance Frequency)* CTS surveillance requirements for the Power Range Neutron Flux CHANNEL CALIBRATION are listed in Table 4.3-1 as D [(2)]. This requires the four Power Range channels to be compared to the heat balance of the RCS (calorimetric) on a daily basis. Note [(2)] state that the heat balance is required to be performed above 15 % RTP. ITS SR 3.3.1.2 for the Power Range Neutron Flux must be performed every 24 hours. The requirement is modified by Note 2, which states, "Not required to be performed until 12 hours after THERMAL POWER is ≥ 15 % RTP." This changes the CTS by allowing 12 hours to perform a CHANNEL CALIBRATION after THERMAL POWER of the Power Range channels exceeds 15 % RTP for the initial surveillance testing.

This change is acceptable because the new Surveillance Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The allowance of 12 hours after exceeding 15 % RTP is a reasonable period of time during a plant start up. The transient nature of returning the plant to full power and performing the required testing requires the plant to be in a steady state condition. The operator monitors power level indications on a continuous basis and CHANNEL CHECKS must be performed on the Power Range channels on a 12-hour basis. The performance of the CHANNEL CHECK is sufficient compensatory measures to ensure the OPERABILITY for the Power Range channel instrumentation until the CHANNEL CALIBRATION is performed. This change is designated as less restrictive because Surveillances will be performed less frequently under the ITS than under the CTS.

L.16 *(Category 7 – Relaxation of Surveillance Frequency)* CTS Table 4.3-1 lists a CHANNEL CALIBRATION requirement for the Power Range channels as M [(3)]. This requires CHANNEL CALIBRATION to be performed every 31 days. ITS SR 3.3.1.3 requires a comparison of the incore measurements to the excore indication every 31 effective full power days (EFPD). Other changes associated with this requirement are addressed in DOC L.9 and A.28. This changes the CTS by allowing CHANNEL CALIBRATION to be performed on an EFPD basis instead of calendar days.

RAI 3.3.1-34 RS

The purpose of the ITS SR Frequency expressed in EFPD is to relate the requirement to a meaningful time frame. This change is acceptable because the new Surveillance

Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The allowance for performing the comparison of the NIS channels indications to the incore indications are a function of burn up and not calendar days. This change is designated as less restrictive because Surveillances may be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-34 RS

L.17 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* The CTS requires a CHANNEL FUNCTIONAL TEST for the Source Range Neutron Flux channels on a quarterly basis. Normally, if the reactor has been operating in MODE 1 for greater than 92 days, the surveillance should be performed prior to entering the MODE of Applicability on a reactor shutdown. The MODES of Applicability for these channels are listed as 2, 3, 4, and 5. To not perform the required surveillance prior to entry into the MODE of Applicability requires an exception to Surveillance Requirement 4.0.4. The CTS requirements do not contain the required exception. ITS SR 3.3.1.7 for the Source Range Neutron Flux channel requires a COT be performed every 92 days. This surveillance requirement is modified by a Note, which states, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3." The applicable MODES for this requirement are listed as $2^{(d)}$, $3^{(a)}$, $4^{(a)}$, and $5^{(a)}$. Note $^{(d)}$ states, "Below the P-6 (Intermediate Range Neutron Flux) interlocks. Note $^{(a)}$ states, "With Rod Control System capable of rod withdrawal or one or more rods not fully inserted." This changes the CTS by allowing 4 hours, after entering MODE 3 from MODE 2, to perform the COT on the Source Range channels.

This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. The allowance of 4 hours is reasonable period of time to delay the performance of the required testing during the transient condition of a plant shut down. During this period of time, the operator attention should not be distracted. Operating experience has shown that the Source Range channels usually satisfy these testing requirements, and the channels remain OPERABLE as the reactor shut down is completed. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.18 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 requires for various functions that Action 15 be entered for an inoperable channel in MODES 3*, 4*, and 5*. Note * states, "With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal." Action 15 states that an inoperable channel be returned to OPERABLE status within 48 hours or open the Reactor Trip Breakers (RTBs) within the next hour. ITS Table 3.3.1-1 for Source Range function requires ITS Action J to be entered. Action J states with one channel inoperable, restore the function to OPERABLE status in 48 hours or initiate action to fully insert all rods in 48 hours and place the Rod Control System in a condition incapable of rod withdrawal within 49 hours. The applicable MODES or other

RAI 3.3.1-36 RS

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-35 ITS
STS
CTS
DOC L.17

NRC RAI: Comment: There is a mismatch between the CTS Source Range Neutron Flux trip function markup which shows SR 3.3.1.7 applies and ITS markup which applies SR 3.3.1.8.

Response: The Company agrees with the Comment. The CTS markup has been changed.

A.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1	1. Manual Reactor Trip	N.A.	N.A.		1, 2 and *
2	2. Power Range, Neutron Flux				
2a	A. High Setpoint				1, 2
2b	B. Low Setpoint				1***, 2
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.			1, 2
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.			1, 2
4	5. Intermediate Range, Neutron Flux		N.A.	N.A.	1***, 2 3*, 4*, 5*
5	6. Source Range, Neutron Flux				2, 3, 4, 5
6	7. Overtemperature ΔT				1, 2
7	8. Overpower ΔT				1, 2
8a	9. Pressurizer Pressure – Low				1, 2
8b	10. Pressurizer Pressure – High				1, 2
9	11. Pressurizer Water Level – High				1, 2
10	12. Loss of Flow				1

Response Time Test

N/A	L.20
3.3.1.16	RAI 3.3.1-32 R5
3.3.1.16	
N/A	L.20
3.3.1.16	
N/A	L.20
3.3.1.16	RAI 3.3.1-35 R5
3.3.1.16	
N/A	L.20
3.3.1.16	RAI 3.5.1-39 R5
3.3.1.16	
3.3.1.16	
3.3.1.16	
3.3.1.16	

RAI 3.3.1-32

ITS 3.3.1

NORTH ANNA - UNIT 1

3/4 3-12

page 11 of 20

Amendment No. ~~81, 206~~, 221

Rev. 5

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	Response Time Test
1	1. Manual Reactor Trip	N.A.	N.A.	R LA.F 3.3.1.4 A.11	1, 2 and *	N/A L.20
2	2. Power Range, Neutron Flux		3.3.1.3 L.15 L.7 L.9 A28			RAI 3.3.1-32 R5
2a	A. High Setpoint	A.1 3.3.1.1 8	Q(6) M(3)(6) and R(6) L.16 3.3.1.11 A.1	A.11 3.3.1.7	1, 2	3, 3, 1, 16
2b	B. Low Setpoint	A.1 3.3.1.1 8	R(6) 3.3.1.11 A.1	L.6 S/U(1) 3.3.1.8	1***, 2	3, 3, 1, 16
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(6) 3.3.1.11 A.1	A.11 Q 3.3.1.7	1, 2	N/A L.20
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.	R(6) A.1 3.3.1.11	A.11 Q 3.3.1.7	1, 2	3, 3, 1, 16
4	5. Intermediate Range, Neutron Flux	3.3.1.1 A.1 8 a. b. Q(1)(7) A.10	M.8 LA.13 R(10)(13) 3.3.1.11	L.6 S/U(1), Q(12) 3.3.1.8	1***, 2 3*, 4*, 5*	N/A L.20
5	6. Source Range, Neutron Flux	A.1 3.3.1.1 8 A.5	N.A.	N.A. L.17 3.3.1.7 3.3.1.8 S/U(1) Q(12) L.10	2, 3, 4, 5	3, 3, 1, 16
6	7. Overtemperature ΔT	A.1 3.3.1.1 8	R(10) A.1 3.3.1.11	M.13 Q 3.3.1.6 3.3.1.7 A.11	1, 2	3. 3. 1, 16
7	8. Overpower ΔT	A.1 3.3.1.1 8	R(10) A.1 3.3.1.12	A.28 3.3.1.3 L.16 L.9 Q 3.3.1.7 A.11	1, 2	N/A L.20
8a	9. Pressurizer Pressure – Low	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3, 3, 1, 16
8b	10 Pressurizer Pressure – High	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3, 3, 1, 16
9	11. Pressurizer Water Level – High	A.1 3.3.1.1 8	R A.11 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3. 3. 1, 16
10	12. Loss of Flow	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1	3.3.1.16

RAI 3.3.1-32

RAI 3.3.1-35 R5

RAI 3.3.1-39 R5

ITS 3.3.1

03-09-00

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-36 ITS
STS
CTS
DOC L.18

NRC RAI: Comment: Provide discussion that establishes a safety basis conclusion for the proposed alternative completion times and Actions provided in the ITS.

Response: The Company agrees with the Comment. DOC L.18 has been modified and changed from a category 3 (Completion Times change) to a category 4 (Required Actions change).

Frequency has been evaluated to ensure that it provides an acceptable level of equipment reliability. The allowance for performing the comparison of the NIS channels indications to the incore indications are a function of burn up and not calendar days. This change is designated as less restrictive because Surveillances may be performed less frequently under the ITS than under the CTS.

RAI 3.3.1-34 RS

L.17 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* The CTS requires a CHANNEL FUNCTIONAL TEST for the Source Range Neutron Flux channels on a quarterly basis. Normally, if the reactor has been operating in MODE 1 for greater than 92 days, the surveillance should be performed prior to entering the MODE of Applicability on a reactor shutdown. The MODES of Applicability for these channels are listed as 2, 3, 4, and 5. To not perform the required surveillance prior to entry into the MODE of Applicability requires an exception to Surveillance Requirement 4.0.4. The CTS requirements do not contain the required exception. ITS SR 3.3.1.7 for the Source Range Neutron Flux channel requires a COT be performed every 92 days. This surveillance requirement is modified by a Note, which states, "Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3." The applicable MODES for this requirement are listed as $2^{(d)}$, $3^{(a)}$, $4^{(a)}$, and $5^{(a)}$. Note $^{(d)}$ states, "Below the P-6 (Intermediate Range Neutron Flux) interlocks. Note $^{(a)}$ states, "With Rod Control System capable of rod withdrawal or one or more rods not fully inserted." This changes the CTS by allowing 4 hours, after entering MODE 3 from MODE 2, to perform the COT on the Source Range channels.

This change is acceptable because it has been determined that the relaxed Surveillance Requirement acceptance criteria are not necessary for verification that the equipment used to meet the LCO can perform its required functions. The allowance of 4 hours is reasonable period of time to delay the performance of the required testing during the transient condition of a plant shut down. During this period of time, the operator attention should not be distracted. Operating experience has shown that the Source Range channels usually satisfy these testing requirements, and the channels remain OPERABLE as the reactor shut down is completed. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.18 *(Category 4 – Relaxation of Required Action)* CTS Table 3.3-1 requires for various functions that Action 15 be entered for an inoperable channel in MODES 3*, 4*, and 5*. Note * states, "With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal." Action 15 states that an inoperable channel be returned to OPERABLE status within 48 hours or open the Reactor Trip Breakers (RTBs) within the next hour. ITS Table 3.3.1-1 for Source Range function requires ITS Action J to be entered. Action J states with one channel inoperable, restore the function to OPERABLE status in 48 hours or initiate action to fully insert all rods in 48 hours and place the Rod Control System in a condition incapable of rod withdrawal within 49 hours. The applicable MODES or other

RAI 3.3.1-36 RS

specified conditions for MODES 3, 4, and 5 are modified by Note [(a)]. Note [(a)] states, "With Rod Control System capable of rod withdrawal or one or more rods not fully inserted." This changes the CTS by not requiring the RTBs to be opened but allowing an alternative action to disable the Rod Control System.

RAI 3.3.1-36 R5

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The actuation of the remaining OPERABLE channel will be able to actuate the safety function. The 48-hours allowed is the same time allowed for MODES 1 and 2. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.19 *(Category 1 – Relaxation of LCO Requirements)* CTS Table 2.2-1, Notes 1 and 2, provide the RTS instrumentation trip setpoints formulas for the calculation of Overtemperature (OT) and Overpower (OP) ΔT functions. The values used for various constants specify exact number for each constant to be adjusted. ITS Table 3.3.1-1 Notes 1 and 2 provide the formulas for the calculation of Overtemperature and Overpower ΔT functions. The values for constants P', K_1, K_2, K_3, K_4, K_5, K_6, τ_1, τ_2, and τ_3 are modified with less than or equal to ($\leq$), or greater than or less to ($\geq$) symbols to allow a tolerance. This changes the CTS by allowing the values of the constants to be set to a limit not currently allowed.

This change is acceptable because the LCO requirements continue to ensure that the process variables are maintained consistent with the safety analyses and licensing basis. The value of each constant of the Overtemperature and Overpower ΔT functions is only allowed to vary in the conservative direction for the function. This will ensure their setpoints will not exceed the safety analyses assumption for these functions. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L.20 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.3.1.1.2 states, "The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months." ITS Table 3.3.1-1 under the Surveillance Requirements column lists SR 3.3.1.16. This SR states, "Verify RTS RESPONSE TIME is within limits." This SR is required for all RTS Functions except the following: (1) Manual Reactor Trip, (3.a) Power Range Neutron Flux High Positive Rate, (4) Intermediate Range Neutron Flux, (7) Overpower ΔT, (15) Steam/Feed Flow Mismatch and Low Steam Generator Water Level, (16)

RAI 3.3.1-37 R5

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-37 ITS
STS
CTS
DOC L.20

NRC RAI: Comment: Less restrictive changes to CTS requirements require definitive safety basis justifications which prove beyond a reasonable doubt that public health and safety will not be adversely affected.

Response: The Company agrees with the Comment. DOC L.20 has been modified to justify the proposed change.

specified conditions for MODES 3, 4, and 5 are modified by Note [a]. Note [a] states, "With Rod Control System capable of rod withdrawal or one or more rods not fully inserted." This changes the CTS by not requiring the RTBs to be opened but allowing an alternative action to disable the Rod Control System.

RAI 3.3.1-36 RS

This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a DBA occurring during the repair period. The actuation of the remaining OPERABLE channel will be able to actuate the safety function. The 48-hours allowed is the same time allowed for MODES 1 and 2. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.19 *(Category 1 – Relaxation of LCO Requirements)* CTS Table 2.2-1, Notes 1 and 2, provide the RTS instrumentation trip setpoints formulas for the calculation of Overtemperature (OT) and Overpower (OP) ΔT functions. The values used for various constants specify exact number for each constant to be adjusted. ITS Table 3.3.1-1 Notes 1 and 2 provide the formulas for the calculation of Overtemperature and Overpower ΔT functions. The values for constants P', K_1, K_2, K_3, K_4, K_5, K_6, τ_1, τ_2, and τ_3 are modified with less than or equal to ($\leq$), or greater than or less to ($\geq$) symbols to allow a tolerance. This changes the CTS by allowing the values of the constants to be set to a limit not currently allowed.

This change is acceptable because the LCO requirements continue to ensure that the process variables are maintained consistent with the safety analyses and licensing basis. The value of each constant of the Overtemperature and Overpower ΔT functions is only allowed to vary in the conservative direction for the function. This will ensure their setpoints will not exceed the safety analyses assumption for these functions. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L.20 *(Category 5 – Deletion of Surveillance Requirement)* CTS 4.3.1.1.2 states, "The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months." ITS Table 3.3.1-1 under the Surveillance Requirements column lists SR 3.3.1.16. This SR states, "Verify RTS RESPONSE TIME is within limits." This SR is required for all RTS Functions except the following: (1) Manual Reactor Trip, (3.a) Power Range Neutron Flux High Positive Rate, (4) Intermediate Range Neutron Flux, (7) Overpower ΔT, (15) Steam/Feed Flow Mismatch and Low Steam Generator Water Level, (16)

RAI 3.3.1-37 RS

Turbine Trip, (17) SI input from ESF, (11) Reactor Coolant Pump Breaker Position Trip, (19) Reactor Trip Breakers, (20) RTB Undervoltage and Shunt Trip Mechanisms, and (21) Automatic Trip Logic. This changes the CTS by deleting the Response Time Testing requirements for the listed functions.

RAI 3.3.1-37 RS

The purpose of ITS SR 3.3.1.16 is to ensure that the required functions are response time tested and the required times are met. This change is acceptable because the deleted Surveillance Requirements are not necessary to verify that the RTS functions used to meet the LCO are consistent with the safety analysis. This is not a change in the testing requirements of the safety functions but a correction in the listed requirements. The appropriate RTS functions will continue to be tested in a manner and at a frequency necessary to give confidence that the assumptions in the safety analysis are protected and the required RTS functions can perform their assumed safety function. The deletion of the Response Time Testing for the listed RTS functions is acceptable because the testing requirements are the same requirements that were originally moved from the Technical Specifications to the Technical Requirements Manual. This change is designated as less restrictive because Surveillances which are required in the CTS will not be required in the ITS.

L.21 *(Category 1 – Relaxation of LCO Requirements)* CTS 2.2 Limiting Safety System Setting states in Table 2.2-1 Note 3, "the channel's maximum trip point shall not exceed its computed trip point by more than 2 percent of span." This applies to the Overtemperature and Overpower ΔT trip setpoints for the Allowable Values as stated in Notes 1 and 2. ITS 3.3.1 in Table 3.3.1-1 states for the Overtemperature and Overpower ΔT that the functions Allowable Values are listed in Notes 1 and 2. The Overtemperature ΔT Allowable Value formula is modified by a Note that states, "The Overtemperature ΔT Function Allowable Value shall not exceed the following nominal trip setpoint by more than 2.3 % of ΔT span." This changes the CTS requirement for Overtemperature ΔT by increasing the % of ΔT span from a value of 2.0 to 2.3.

The purpose of ITS 3.3.1 Allowable Value for the Overtemperature ΔT change from 2.0 to 2.3 is to establish a value that is consistent with the setpoint methodology. This change is acceptable because the LCO requirements continue to ensure that the process variables are maintained consistent with the safety analyses and licensing basis. The change to 2.3 % of ΔT span is consistent with the method used to calculate the other RTS and ESFAS Allowable Values. This change is designated as less restrictive because less stringent LCO requirements are being applied in the ITS than were applied in the CTS.

L.22 *(Category 2 – Relaxation of Applicability)* Unit 1 CTS Table 4.3-1 Function 18, Turbine Trip on Low Auto Stop Oil Pressure or Turbine Stop Valve Closure states the related Surveillance is required as MODES 1 and 2. The Surveillance required is a CHANNEL FUNCTIONAL TEST with a listed frequency of S/U (1). S/U requires

RAI 3.3.1-01 RS

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-38 ITS N/A
STS Action L.2
CTS Action 5
JFD (Specification) 10

NRC RAI: Comment: Review of operability requirements for Source Range Monitors in MODES 3, 4 and 5 with the RTBs opens indicates that the SRM function is incapable of performing a reactor trip. Review of the justification given in TSTF 135 for removing the monitoring function from the Reactor Protection System is that the requirements are not related to RTS, but involve BDPS instrumentation. Review of the ITS for SRM operability in MODES 3, 4 and 5 with the reactor trip breakers open provides appropriate limiting conditions for operation, including surveillance requirements. The current justification for deviation does not sufficiently make the case that the North Anna 1 & 2 design basis is different enough to support deviation from the ISTS in that a separate LCO for MODE 3, 4 and 5 requirements with the reactor trip breakers open can be proposed for ITS that meets the intent of the ISTS.

Response: The Company agrees with the Comment. JFD 10 is modified to provide sufficient justification that the requirement should remain in the ITS and not be included as a separate LCO.

6. ISTS Table 3.3.1-1 contains a reviewer's Note [(a)]. This Note is not applicable to the NAPS ITS and is eliminated. The subsequent notes are re-lettered. The methodology used for the Allowable Values generally provides for a Trip Setpoint at a constant value below the Allowable Value. Therefore, the Trip Setpoint is a constant offset and not required to be listed in the Technical Specification and the column is eliminated. The values for all Trip Setpoints will be retained in a licensee-controlled Technical Requirement Manual (TRM), which is subject to the controls of the 10 CFR 50.59 process for changes. This change incorporates the intent of approved traveler TSTF–355.

7. The brackets are removed and the proper plant specific information/value is provided.

8. The COT (SR 3.3.1.9) for underfrequency testing of the RCP buses is required for Unit 2 only. Physical modifications would be required to perform this testing on Unit 1. Operating experience on Unit 2 has shown that these functions usually satisfy the surveillance requirement. Therefore, the requirement is not added to Unit 1.

9. The Note to ISTS 3.3.1.12 is not applicable for the North Anna design and deleted for the ITS. This change is acceptable because the North Anna RCS temperature detection does not utilize RTDs on the bypass loops but uses RTDs directly in the RCS flow path.

10. TSTF-135 deletes the requirement for Function 5, Source Range Neutron Flux requirements, to be OPERABLE in MODES 3, 4, and 5 when the Rod Control System is incapable of moving the shutdown or control rods. Function 5 requires one Source Range channel to be OPERABLE. Condition L requires when the required channel becomes inoperable that operations involving positive reactivity addition be immediately suspended and the SDM verified within 1 hour and every 12 hours thereafter. The justification given in TSTF-135 for deleting these requirements is that they are moved to ISTS LCO 3.3.9, Boron Dilution Protection System (BDPS). North Anna does not utilize a BDPS for protection against a boron dilution accident. North Anna in ITS LCO requirements 3.1.8 and 3.9.2 require the manual isolation of the boron dilution valves to prevent possible boron dilution events. The current requirements for maintaining one OPERABLE Source Range channel with an associated ITS Action K requiring the verification of SDM within an hour and every 12 hours is translated into ITS 3.3.1 requirements.

RAI 3.3.1-38 R5

11. ITS SR 3.3.1.16 requirement to perform RESPONSE TIME testing on the Overpower ΔT and Steam Generator Level Low coincident with Steam Flow Feedwater Flow Mismatch functions are deleted from the ITS. This is acceptable because neither function is credited by the safety analyses. Pressurizer Water Level – High, ITS function 9, is credited by the safety analyses. This change is acceptable because RESPONSE TIME testing ensures safety analysis assumptions are met.

12. Not used

North Anna Improved Technical Specifications (ITS) Review Comments
ITS Section 3.3, Instrumentation
LCO 3.3.1, RTS Instrumentation

3.3.1-39 ITS SR 3.3.1.6 (Function 6 OTDT)
STS SR 3.3.1.6 (Function 6 OTDT)
CTS N/A
JFD (Specification) 15

NRC RAI: Comment: Changing ISTS SR 3.3.1.6 to "Compare" from "Calibrate" is a generic change that requires documentation of a design difference or an approved TSTF.

Response: The Company disagrees with the Comment. The requirement reflects the current licensing basis for the function. JFD 15 is modified to provide sufficient justification that the modified requirement should remain in the ITS requirements. A more restrictive change DOC M.13 is added to the CTS requirements.

13. References to RTS interlock P-9 are deleted. The North Anna design does not utilize this function, but uses the P-8 function to perform the same requirements. Function e. and f. have been re-lettered.

14. The Overtemperature ΔT and Overpower ΔT formulas of the ISTS Table 3.3.1-1 in Notes 1 and 2 have been modified to reflect the North Anna CTS requirements. These changes are acceptable because they reflect the CTS formulas in the ITS requirements for these functions. Values for the notes, such as τ_4, τ_5, τ_6, and τ_7 that are not needed, are deleted.

15. ISTS SR 3.3.1.6 states that a calibration of excore channels is required to be performed to make the channels agree with the incore detector measurements. A CTS requirement to perform a CHANNEL CALIBRATION on a quarterly basis for the Power Range channels would have been translated into this ITS requirement. The quarterly CHANNEL CALIBRATION for the Power Range channels was required before it was deleted by a Technical Specification change #221 for Unit 1 and #202 for Unit 2 (TAC #s MA5448 and MA 5450) dated March 9, 2000. A letter dated December 16, 1999 proposed the deletion of the requirement. The safety evaluation for the TS change states, "The specific TS changes and the licensee's justification are listed in the licensee's submittal dated May 6, 1999, Attachment 1 (Pages 9 through 17) and Attachment 2, as supplemented June 22 and December 16, 1999. The staff has reviewed all these changes based on the generic evaluation provided earlier and finds them acceptable." ITS SR 3.3.1.6 requires a comparison of the results of the incore detector measurement and the excore channels. Note 1 to the SR states, "Adjust NIS channel if absolute difference is $\geq$ 3%." This change is acceptable because the results of the incore measurements to excore channels will cause the NIS channels for the f (ΔI) input to the OTΔT function to be readjusted if the difference is 3% or more. Note 1 is added to prevent unnecessary recalibration when the difference between the NIS channels and incore measurements is small and less than 3% between the actual and indicated values.

RAI 3.3.1-39 R5

16. The CHANNEL OPERATIONAL TEST (COT) and the CHANNEL CALIBRATION apply to the P–10 and P–13 inputs, not the P–7 logic function. Logic functions are tested under SR 3.3.1.5. This change is an administrative clarification to address the relationship between these interlocks. This change is consistent with proposed change TSTF–347.

RAI 3.3.1-05 R5

17. ISTS Table 3.3.1-1 Function 2.A, Power Range Neutron Flux High, does not specify a monthly CHANNEL CALIBRATION to be performed. ITS SR 3.3.1.3 is added to the Power Range Neutron Flux High requirements. This requires a comparison of incore to excore indication of AFD every 31 EFPD. An adjustment of the NIS channels is required if absolute difference is $\geq$ 3%. The SR is not required to be performed until 24 hours after THERMAL POWER exceeds 15 % RTP. This change is acceptable because all PRNF channels provide inputs for determining QPTR that require accurate AFD indications.

RAI 3.3.1-32 R5

A.1

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	Response Time Test
1	1. Manual Reactor Trip	N.A.	N.A.	Q(8) A.4	1, 2 and *	N/A L.20
2	2. Power Range, Neutron Flux			3.3.1.14 A.11		
2a	A. High Setpoint	A.1 3.3.1.1 8	L.15 3.3.1.2 D(2)(6) and R(6) A.1 3.3.1.11 M(3)(6) 3.3.1.5 L.9 L.16 A.2*	Q 3.3.1.7 A.11	1, 2	3.3.1.16 RAI 3.3.1-32 R5
2b	B. Low Setpoint	A.1 3.3.1.1 8	R(6) 3.3.1.11 A.1	S/U(1) 3.3.1.8 L.6	1***, 2	3.3.1.16
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.	R(6) 3.3.1.11 A.1	Q 3.3.1.7 A.11	1, 2	N/A L.20
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.	R(6) 3.3.1.11 A.1	Q 3.3.1.7 A.11	1, 2	3.3.1.16
4	5. Intermediate Range, Neutron Flux	A.1 3.3.1.1 8 a. b. Q(12) A.10	M.8 LA.13 R(6) 3.3.1.11	S/U(1) Q(12) 3.3.1.8 L.6	1***, 2 3*, 4*, 5*	N/A L.20
5	6. Source Range, Neutron Flux	A.1 3.3.1.1 8 7A A.5	N.A.	N.A. L.17 3.3.1.7 3.3.1.8 S/U(1) Q(12) L.10	2, 3, 4, 5	3.3.1.16 RAI 3.3.1-35 R5
6	7. Overtemperature ΔT	A.1 3.3.1.1 8	R(6) A.1 3.3.1.12	M.13 3.3.1.6 A.2P Q 3.3.1.7 A.11 3.3.1.3 L.9 L.16	1, 2	3.3.1.16
7	8. Overpower ΔT	A.1 3.3.1.1 8	R(6) A.1 3.3.1.12	Q 3.3.1.7 A.11	1, 2	N/A L.20
8a	9. Pressurizer Pressure – Low	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16 RAI 3.5.1-39 R5
8b	10. Pressurizer Pressure – High	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
9	11. Pressurizer Water Level – High	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
10	12. Loss of Flow	A.1 3.3.1.1 8	R A.1 3.3.1.10	Q 3.3.1.7 A.11	1	3.3.1.16

RAI 3.3.1-32

A.5 A.7 A.11

ITS 3.3.1

NORTH ANNA - UNIT 1

3/4 3-12

page 11 of 20

Amendment No. ~~81, 206~~, 221

Rev. 5

Page 13 of 22

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

ITS	FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED	Response Time Test
1	1. Manual Reactor Trip	N.A.	N.A.	R LA F; 3.3.1.14 A.11	1, 2 and *	N/A L.20
2	2. Power Range, Neutron Flux		3.3.1.3; L.15 L.7 L.9 A28			
2a	A. High Setpoint	A.1; 3.3.1.1 S	D M(3)(6); and R 3.3.1.11 A.1; L.16	A.11; Q 3.3.1.7	1, 2	3.3.1.16 RAI 3.3.1-32 R5
2b	B. Low Setpoint	A.1; 3.3.1.1 S	R 3.3.1.11 A.1	L.6; S/U(1) 3.3.1.8	1***, 2	3.3.1.16
3a	3. Power Range, Neutron Flux, High Positive Rate	N.A.	R 3.3.1.11 A.1	A.11; Q 3.3.1.7	1, 2	N/A L.20
3b	4. Power Range, Neutron Flux, High Negative Rate	N.A.	R A.1; 3.3.1.11	A.11; Q 3.3.1.7	1, 2	3.3.1.16
4	5. Intermediate Range, Neutron Flux	3.3.1.1 A.1 S; a. b. Q A.10	M B LA.13; R 3.3.1.11	L.6; S/U(11) Q(12) 3.3.1.8	1***, 2	N/A L.20
5	6. Source Range, Neutron Flux	A.1; 3.3.1.1 B A.5	N.A.	N.A. L.13; 3.3.1.7 3.3.1.8; S/U(11) Q(12) L.10	3*, 4*, 5* 2, 3, 4, 5	3.3.1.16 RAI 3.3.1-35 R5
6	7. Overtemperature ΔT	A.1; 3.3.1.1 S	R A.1; 3.3.1.11	M.13; 3.3.1.6; Q 3.3.1.7 A.11	1, 2	3.3.1.16 RAI 3.3.1-39 R5
7	8. Overpower ΔT	A.1; 3.3.1.1 S	R A.1; 3.3.1.12	A.28; 3.3.1.3 L.16 L.9; Q 3.3.1.7 A.11	1, 2	N/A L.20
8a	9. Pressurizer Pressure – Low	A.1; 3.3.1.1 S	R A.1; 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
8b	10 Pressurizer Pressure – High	A.1; 3.3.1.1 S	R A.1; 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
9	11. Pressurizer Water Level – High	A.1; 3.3.1.1 S	R A.1; 3.3.1.10	Q 3.3.1.7 A.11	1, 2	3.3.1.16
10	12. Loss of Flow	A.1; 3.3.1.1 S	R A.1; 3.3.1.10	Q 3.3.1.7 A.11	1	3.3.1.16

RAI 3.3.1-32

ITS 3.3.1

03-09-00

Rev 5

more rods not fully inserted." If either function becomes inoperable Conditions S (MODES 1 and 2) or Condition C (MODES 3(a), 4(a), and 5(a)) must be entered. Required Actions for Condition C direct that the inoperable trip mechanism be restored to OPERABLE status within 48 hours or insert all rods and place the Rod Control System in a condition where rods cannot be withdrawn. This is required within one hour. This changes the CTS by requiring the diverse trip functions to be OPERABLE in MODES 3(a), 4(a), and 5(a), and adding of ITS Condition C requirements.

RAI 3.3.1-14 R5

The purpose of the additional ITS requirements in applicability and Condition C is to provide appropriate requirements for the RTB when the Rod Control System is capable of rod withdrawal. This change is acceptable because the RTB must be capable of tripping the rods any time the rods are withdrawn or capable of being withdrawn. This requirement ensures the Reactor Trip System can provide its safety function. This change is designated as more restrictive because additional requirements are provided in the ITS.

M.12 CTS Table 3.3-1 Function 21A Reactor Trip Breakers lists Action 1 to be entered for an inoperable channel in MODES 1 and 2. CTS Action 14 is applicable for the RTBs for the diverse trip function and it states, "With one of the diverse trip features (undervoltage or shunt trip device) inoperable, restore it to OPERABLE status within 48 hours or declare the breaker inoperable and apply Action 1. The breaker shall not be bypassed while one of the diverse trip features is inoperable except for the time required for performing maintenance to restore the breaker to OPERABLE status." ITS Table 3.3.1–1 Function 19 RTB requires 2 trains to be OPERABLE in MODES 1 and 2 and Condition P to be entered if one RTB train is inoperable. Condition P states that with one train inoperable, it must be restored to OPERABLE status in one hour or be in MODE 3 within 7 hours. Three Notes modify the Condition. Note 2 states, "One RTB may be bypassed for up to 2 hours for maintenance on undervoltage or shunt trip mechanisms, provided the other train is OPERABLE." This changes the CTS requirements for the RTBs by limiting to 2 hours any maintenance on the undervoltage or shunt trip mechanism before declaring the RTB train inoperable.

RAI 3.3.1-02 3.3.1-18 R5

The purpose of the ITS Condition P Note is to allow a reasonable amount of time to conduct repairs on an inoperable undervoltage or shunt trip mechanism without declaring the RTB train inoperable. This change is acceptable because the RTB on the other train and the bypass RTB on this train both remain capable of tripping the reactor. Two hours is a reasonable period of time to allow the bypass RTB to substitute for the inoperable RTB. This change is more restrictive because the CTS does not limit the time for performing maintenance, whereas the ITS limits the time to 2 hours.

M.13 CTS Table 4.3–1 Surveillance Requirements do not require a quarterly test on the OTΔT Functions to ensure an accurate input for the f (ΔI) from the required Power Range channels. ITS Table 3.3.1–1 Function 6 states SR 3.3.1.6 must be performed.

RAI 3.3.1-39 R5

ITS SR 3.3.1.6 states, "Compare results of the excore channels to the incore detector measurements." This SR must be performed every 92 effective full power days (EFPD). Two Notes modify the requirement. Note 1 states, " Adjust NIS channel if absolute difference is ≥ 3%." Note 2 states, "Not required to be performed until 24 hours after THERMAL POWER is ≥ 50%." This changes the CTS by requiring an additional Surveillance Requirement for the OTΔT Function.

RAI 3.3.1-39 RS

The purpose of ITS SR 3.3.1.6 is to ensure accurate inputs of f (ΔI) from NIS channels for the OTΔT Function. This change is acceptable because the OTΔT Functions receive inputs for the f (ΔI) portion of the equation from the Power Range channels. This SR requires an accurate comparison and possible adjustment of the Power Range channels to the incore measurements so that the f (ΔI) can be determined for the OTΔT Function. The change is classified as more restrictive because an additional Surveillance Requirement is added to the current requirements.

REMOVED DETAIL CHANGES

LA.1 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS Surveillance Requirement 4.3.1.1.2 requires the RTS trip functions to be response time tested. This requirement includes the following, "Response of the neutron flux signal portion of the channel time shall be measured from the detector output or input of the first electronic component in the channel." ITS SR 3.3.1.16 requires RESPONSE TIME testing of the RTS functions. This changes the CTS by moving the descriptive wording from the Specifications to the ITS Bases.

RAI 3.3.1-25 RS

The removal of these details for performing surveillance requirements from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to perform RESPONSE TIME TESTING. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

LA.2 *(Type 1 – Removing Details of System Design and System Description, Including Design Limits)* CTS 3.3.1.1 requires two Source Range channels be OPERABLE in MODE 2 ##. The note ## states that the high voltage to detector may be de-energized above P-6. ITS requirement for the Source Range channel state that two channels must be OPERABLE in MODE 2(d). Note (d) specifies, "Below the P-6 (Intermediate Range Neutron Flux) interlock" and maintains the intent of the CTS requirement.

CHANGES NOT ASSOCIATED WITH RAIs

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

1. Specification in Table 3.3.1-1 Function 8.b Pressurizer Pressure High is listed the applicable MODES or other specified conditions as 1, 2 [(f)]. The notation [(f)] is incorrect and is deleted.

2. Bases section for Signal Process Control and Protection System adds two paragraphs that describe the use of 3 and 4 channel logic for monitoring a parameter.

3. The Bases section for Allowable Values and RTS Setpoints in the first paragraph makes minor wording corrections. In the original submittal, the first sentence in the first paragraph stated, "The trip setpoints used in the bistables are summarized analytical limits stated in Reference 6. The fourth sentence stated, " The methodology used to evaluate...is provided in..."

4. Bases section for Reactor Trip Switchgear in the second paragraph adds a discussion of the diagrams contained in the UFSAR. This describes the various permissive interlocks and how they are tested with the unit at power.

5. Bases section for Applicable Safety Analysis (ASA), LCO, and Applicability in the fourth paragraph adds a discussion of four-channel instrumentation configuration.

6. The Bases section for ASA, LCO, and Applicability for Function 5 first paragraph makes minor wording changes. In the original submittal, the last sentence of the first paragraph stated, " Therefore, the functional capability at the specified Allowable Value..."

7. Bases section for ASA, LCO, and Applicability for Function 11 headings for single and two loop discussions are removed to be consistent with TSTF – 135 changes.

8. Bases section for ASA, LCO, and Applicability for Function 16 adds a discussion of the interface of auto stop oil with the Turbine EHC system.

9. Bases section for ASA, LCO, and Applicability for Function 18 part b for P-7 makes minor wording changes.

10. Bases section for Action D fourth paragraph makes minor wording changes.

11. Bases section for Action L in the first and third paragraphs adds a discussion of a plant specific risk assessment.

12. Bases section for SR 3.3.1.4 in the second paragraph makes minor wording changes.

13. Bases section for SR 3.3.1.8 in the second paragraph deletes the last sentence. This sentence stated, "The performance of this SR is not required if it has been performed within the 92-day frequency with the unit operating above the MODE of applicability for the Source Range, Intermediate Range, and Power Range (Low Setpoint) functions." This sentence is redundant and not necessary.

14. Bases section for SR 3.3.1.9 in the first paragraph deletes the second sentence. This sentence stated, "This Surveillance is required to be performed on Unit 2 only."

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

15. Bases section for SR 3.3.1.12 in the second paragraph changes the "rate lag compensation" to "dynamic compensation." This is required because the SR verifies OTΔT and OPΔT functions. One function has a "rate lead" compensation correction, while the other has a "rate lag" compensation correction. "Dynamic compensation" provides an accurate description for these compensation factors.

16. Bases section for SR 3.3.1.14 in the first paragraph makes minor wording changes.

17. Bases section for SR 3.3.1.16 third paragraph states, " . . . with the resulting measured response time compared to the appropriate UFSAR response time." This is incorrect and should state, " . . . TRM response time."

18. Bases section for References states, "WCAP-10271-P-A Supplement 2, Rev.1, June 1990," is for the RTS. This should state "Supplement 1."

19. Reference section for number 6 states that technical report EE-0101 is the RTS/ESFAS Setpoint Methodology Study. This should state that "Technical Reports EE-0101 and EE0116."

20. Various Bases sections NUREG –1431 markup corrections.

21. A correction to DOC LA.6.

22. A correction to DOC M.8.

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

1. Specification in Table 3.3.1-1 Function 8.b Pressurizer Pressure High is listed the applicable MODES or other specified conditions as 1, 2 [f]. The notation [f] is incorrect and is deleted.

Table 3.3.1-1 (page 2 of 5)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Overtemperature ΔT	1, 2	3	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3.1-16)
7. Overpower ΔT	1, 2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12	Refer to Note 2 (Page 3.3.1-17)
8. Pressurizer Pressure					
a. Low	1(f)	3	L	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1860 psig
b. High	1, 2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2370 psig R5
9. Pressurizer Water Level–High	1(f)	3	L	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 93%
10. Reactor Coolant Flow–Low	1(f)	3 per loop	L	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 89%
11. Reactor Coolant Pump (RCP) Breaker Position	1(f)	1 per RCP	M	SR 3.3.1.14	NA
12. Undervoltage RCPs	1(f)	1 per bus	L	SR 3.3.1.9 SR 3.3.1.10 SR 3.3.1.16	≥ 2870 V
13. Underfrequency RCPs	1(f)	1 per bus	L	SR 3.3.1.9 (Unit 2 only) SR 3.3.1.10 SR 3.3.1.16	≥ 56 Hz
14. Steam Generator (SG) Water Level–Low Low	1, 2	3 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 17%

(f) Above the P-7 (Low Power Reactor Trips Block) interlock.

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

2. Bases section for Signal Process Control and Protection System adds two paragraphs that describe the use of 3 and 4 channel logic for monitoring a parameter.

BASES

BACKGROUND (continued)

Signal Process Control and Protection System

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. These setpoints are defined in UFSAR, Chapter 7 (Ref. 1), Chapter 6 (Ref. 2), and Chapter 15 (Ref. 3). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the SSPS for decision evaluation. Channel separation is maintained up to and through the input bays. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the SSPS, while others provide input to the SSPS, the main control board, the unit computer, and one or more control systems.

When a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If one channel fails in a direction that would not result in a partial Function trip, the Function is still OPERABLE with a two-out-of-two logic. If one channel fails, such that a partial Function trip occurs, a trip will not occur and the Function is still OPERABLE with a one-out-of-two logic. R5

When a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Again, a single failure will neither cause nor prevent the protection function actuation. These requirements are described in IEEE-279-1971 (Ref. 4). The actual number of channels required for each unit parameter is specified in Reference 1.

Two logic channels are required to ensure no single random failure of a logic channel will disable the RTS. The logic channels are designed such that testing required while the

(continued)

BASES

BACKGROUND

Field Transmitters or Sensors (continued)

Values. The OPERABILITY of each transmitter or sensor can be evaluated when its "as found" calibration data are compared against its documented acceptance criteria. <INSERT> TSTF 355

Signal Process Control and Protection System

Generally, three or four channels of process control equipment are used for the signal processing of unit parameters measured by the field instruments. The process control equipment provides signal conditioning, comparable output signals for instruments located on the main control board, and comparison of measured input signals with setpoints established by safety analyses. These setpoints are defined in the FSAR, Chapter [7] (Ref. 1), Chapter [6] (Ref. 2), and Chapter [15] (Ref. 3). If the measured value of a unit parameter exceeds the predetermined setpoint, an output from a bistable is forwarded to the SSPS for decision evaluation. Channel separation is maintained up to and through the input bays. However, not all unit parameters require four channels of sensor measurement and signal processing. Some unit parameters provide input only to the SSPS, while others provide input to the SSPS, the main control board, the unit computer, and one or more control systems.

When Generally, if a parameter is used only for input to the protection circuits, three channels with a two-out-of-three logic are sufficient to provide the required reliability and redundancy. If one channel fails in a direction that would not result in a partial Function trip, the Function is still OPERABLE with a two-out-of-two logic. If one channel fails, such that a partial Function trip occurs, a trip will not occur and the Function is still OPERABLE with a one-out-of-two logic.

When Generally, if a parameter is used for input to the SSPS and a control function, four channels with a two-out-of-four logic are sufficient to provide the required reliability and redundancy. The circuit must be able to withstand both an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Again, a single failure will neither cause nor

(continued)

RS

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

3. The Bases section for Allowable Values and RTS Setpoints in the first paragraph makes minor wording corrections. In the original submittal, the first sentence in the first paragraph stated, "The trip setpoints used in the bistables are summarized analytical limits stated in Reference 6. The fourth sentence stated, " The methodology used to evaluate...is provided in..."

BASES

BACKGROUND

Signal Process Control and Protection System (continued)

reactor is at power may be accomplished without causing trip. Provisions to allow removing logic channels from service during maintenance are unnecessary because of the logic system's designed reliability.

Allowable Values and RTS Setpoints

The trip setpoints used in the bistables are based on the analytical limits cited in Reference 6. The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those RTS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 5), the Allowable Values specified in Table 3.3.1-1 in the accompanying LCO are conservative with respect to the analytical limits. The methodology used to calculate the trip setpoints and Allowable Values, including their explicit uncertainties, is cited in the "RTS/ESFAS Setpoint Methodology Study" (Ref. 6) which incorporates all of the known uncertainties applicable to each channel. The magnitudes of these uncertainties are factored into the determination of each trip setpoint and corresponding Allowable Value. The trip setpoint entered into the bistable is more conservative than that specified by the Allowable Value (LSSS) to account for measurement errors detectable by the COT. The Allowable Value serves as the Technical Specification OPERABILITY limit for the purpose of the COT. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE. R5 R5 R5

The trip setpoint is the value at which the bistable is set and is the expected value to be achieved during calibration. The trip setpoint value ensures the LSSS and the safety analysis limits are met for surveillance interval selected when a channel is adjusted based on stated channel uncertainties. Any bistable is considered to be properly adjusted when the "as left" setpoint value is within the band for CHANNEL CALIBRATION uncertainty allowance (i.e., ± rack calibration + comparator setting uncertainties). The trip

(continued)

BASES

BACKGROUND

Signal Process Control and Protection System (continued)

prevent the protection function actuation. These requirements are described in IEEE-279-1971 (Ref. 4). The actual number of channels required for each unit parameter is specified in Reference 1.

Two logic channels are required to ensure no single random failure of a logic channel will disable the RTS. The logic channels are designed such that testing required while the reactor is at power may be accomplished without causing trip. Provisions to allow removing logic channels from service during maintenance are unnecessary because of the logic system's designed reliability.

Trip Setpoints and Allowable Values and RTS Setpoints

The Trip Setpoints are the nominal values at which the bistables are set. Any bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy (i.e., ± rack calibration + comparator setting accuracy).

The Trip Setpoints used in the bistables are based on the analytical limits stated in Reference 2. The selection of these Trip Setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, instrument drift, and severe environment errors for those RTS channels that must function in harsh environments as defined by 10 CFR 50.49 (Ref. 5), the Trip Setpoints and Allowable Values specified in Table 3.3.1-1 in the accompanying LCO are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the Trip Setpoints, including their explicit uncertainties, is provided in the "RTS/ESFAS Setpoint Methodology Study" (Ref. 6). The actual nominal Trip Setpoint entered into the bistable is more conservative than that specified by the Allowable Value to account for changes in random measurement errors detectable by a COT. One example of such a change in measurement error is drift during the surveillance interval. If the measured setpoint does not exceed the Allowable Value, the bistable is considered OPERABLE.

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

4. Bases section for Reactor Trip Switchgear in the second paragraph adds a discussion of the diagrams contained in the UFSAR. This describes the various permissive interlocks and how they are tested with the unit at power.

BASES

BACKGROUND

Solid State Protection System (continued)

The bistable outputs from the signal processing equipment are sensed by the SSPS equipment and combined into logic matrices that represent combinations indicative of various unit upset and accident transients. If a required logic matrix combination is completed, the system will initiate a reactor trip or send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.

Reactor Trip Switchgear

The RTBs are in the electrical power supply line from the control rod drive motor generator set power supply to the CRDMs. Opening of the RTBs interrupts power to the CRDMs, which allows the shutdown rods and control rods to fall into the core by gravity. Each RTB is equipped with a bypass breaker to allow testing of the RTB while the unit is at power. During normal operation the output from the SSPS is a voltage signal that energizes the undervoltage coils in the RTBs and bypass breakers, if in use. When the required logic matrix combination is completed, the SSPS output voltage signal is removed, the undervoltage coils are de-energized, the breaker trip lever is actuated by the de-energized undervoltage coil, and the RTBs and bypass breakers are tripped open. This allows the shutdown rods and control rods to fall into the core. In addition to the de-energization of the undervoltage coils, each RTB is also equipped with a shunt trip attachment device that is energized to trip the breaker open upon receipt of a reactor trip signal from the SSPS. Either the undervoltage coil or the shunt trip mechanism is sufficient by itself, thus providing a diverse trip mechanism.

The logic Functions are described in the functional diagrams included in Reference 2. In addition to the reactor trip or ESF, these diagrams also describe the various "permissive interlocks" that are associated with unit conditions. Each train has a built in testing device that can automatically test the logic Functions and the actuation devices while the unit is at power. When any one train is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed. The testing device is semiautomatic to minimize testing time. R5

BASES

BACKGROUND

Solid State Protection System (continued)

The SSPS performs the decision logic for actuating a reactor trip or ESF actuation, generates the electrical output signal that will initiate the required trip or actuation, and provides the status, permissive, and annunciator output signals to the main control room of the unit.

The bistable outputs from the signal processing equipment are sensed by the SSPS equipment and combined into logic matrices that represent combinations indicative of various unit upset and accident transients. If a required logic matrix combination is completed, the system will initiate a reactor trip or send actuation signals via master and slave relays to those components whose aggregate Function best serves to alleviate the condition and restore the unit to a safe condition. Examples are given in the Applicable Safety Analyses, LCO, and Applicability sections of this Bases.

Reactor Trip Switchgear

The RTBs are in the electrical power supply line from the control rod drive motor generator set power supply to the CRDMs. Opening of the RTBs interrupts power to the CRDMs, which allows the shutdown rods and control rods to fall into the core by gravity. Each RTB is equipped with a bypass breaker to allow testing of the RTB while the unit is at power. During normal operation the output from the SSPS is a voltage signal that energizes the undervoltage coils in the RTBs and bypass breakers, if in use. When the required logic matrix combination is completed, the SSPS output voltage signal is removed, the undervoltage coils are de-energized, the breaker trip lever is actuated by the de-energized undervoltage coil, and the RTBs and bypass breakers are tripped open. This allows the shutdown rods and control rods to fall into the core. In addition to the de-energization of the undervoltage coils, each breaker is also equipped with a shunt trip device that is energized to trip the breaker open upon receipt of a reactor trip signal from the SSPS. Either the undervoltage coil or the shunt trip mechanism is sufficient by itself, thus providing a diverse trip mechanism.

RTB attachment (3)

The decision logic matrix Functions are described in the functional diagrams included in Reference 2. In addition to

(3) R5

(continued)

Rev 5

BASES

BACKGROUND

Reactor Trip Switchgear (continued)

the reactor trip or ESF, these diagrams also describe the various "permissive interlocks" that are associated with unit conditions. Each train has a built in testing device that can automatically test the decision logic matrix (3) Functions and the actuation devices while the unit is at power. When any one train is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed. The testing device is semiautomatic to minimize testing time. R5

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RTS functions to maintain the SLs during all AOOs and mitigates the consequences of DBAs in all MODES in which the RTBs are closed. <INSERT 1> TSTF 135

Each of the analyzed accidents and transients can be detected by one or more RTS Functions. The accident analysis described in Reference 3 takes credit for most RTS trip Functions. RTS trip Functions not specifically credited in the accident analysis are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These RTS trip Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. They may also serve as backups to RTS trip Functions that were credited in the accident analysis.

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 in the accompanying LCO, to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. <INSERT 3> TSTF 355

The LCO generally requires OPERABILITY of four or three channels in each instrumentation Function, two channels of Manual Reactor Trip in each logic Function, and two trains in each Automatic Trip Logic Function. Four OPERABLE instrumentation channels in a two-out-of-four configuration may be (3) required when one RTS channel is also used as a control system input. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires RTS action. In R5

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

5. Bases section for Applicable Safety Analysis (ASA), LCO, and Applicability in the fourth paragraph adds a discussion of four-channel instrumentation configuration.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RTS functions to maintain the SLs during all AOOs and mitigates the consequences of DBAs in all MODES in which the Rod Control System is capable of rod withdrawal or one or more rods are not fully inserted.

Each of the analyzed accidents and transients can be detected by one or more RTS Functions. The accident analysis described in Reference 3 takes credit for most RTS trip Functions. RTS trip Functions not specifically credited in the accident analysis are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These RTS trip Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. They may also serve as backups to RTS trip Functions that were credited in the accident analysis.

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 in the accompanying LCO, to be OPERABLE. A channel is OPERABLE with a trip setpoint value outside its calibration tolerance band provided the trip setpoint "as-found" value does not exceed its associated Allowable Value and provided the trip setpoint "as-left" value is adjusted to a value within the "as-left" calibration tolerance band of the nominal trip setpoint. A trip setpoint may be set more conservative than the nominal trip setpoint as necessary in response to the unit conditions. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions.

The LCO generally requires OPERABILITY of four or three channels in each instrumentation Function, two channels of Manual Reactor Trip in each logic Function, and two trains in each Automatic Trip Logic Function. Four OPERABLE instrumentation channels in a two-out-of-four configuration may be required when one RTS channel is also used as a control system input. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires RTS action. In this case, the RTS will still provide protection, even with random failure of one of the other three protection and channels. Three OPERABLE instrumentation channels in a two-out-of-three configuration are generally required when there is no potential for control system and protection system interaction that could simultaneously create a need for RTS trip and disable one RTS channel. The R5

(continued)

BASES

BACKGROUND

Reactor Trip Switchgear (continued)

the reactor trip or ESF, these diagrams also describe the various "permissive interlocks" that are associated with unit conditions. Each train has a built in testing device that can automatically test the decision logic matrix (3) Functions and the actuation devices while the unit is at power. When any one train is taken out of service for testing, the other train is capable of providing unit monitoring and protection until the testing has been completed. The testing device is semiautomatic to minimize testing time. R5

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

The RTS functions to maintain the SLs during all AOOs and mitigates the consequences of DBAs in all MODES in which the RTBs are closed. INSERT 1 TSTF 135

Each of the analyzed accidents and transients can be detected by one or more RTS Functions. The accident analysis described in Reference 3 takes credit for most RTS trip Functions. RTS trip Functions not specifically credited in the accident analysis are qualitatively credited in the safety analysis and the NRC staff approved licensing basis for the unit. These RTS trip Functions may provide protection for conditions that do not require dynamic transient analysis to demonstrate Function performance. They may also serve as backups to RTS trip Functions that were credited in the accident analysis.

The LCO requires all instrumentation performing an RTS Function, listed in Table 3.3.1-1 in the accompanying LCO, to be OPERABLE. Failure of any instrument renders the affected channel(s) inoperable and reduces the reliability of the affected Functions. INSERT 2 TSTF 355

The LCO generally requires OPERABILITY of four or three channels in each instrumentation Function, two channels of Manual Reactor Trip in each logic Function, and two trains in each Automatic Trip Logic Function. Four OPERABLE instrumentation channels in a two-out-of-four configuration may be (3) required when one RTS channel is also used as a control system input. This configuration accounts for the possibility of the shared channel failing in such a manner that it creates a transient that requires RTS action. In R5

(continued)

Rev 5

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Manual Reactor Trip (continued)

possible. In MODE 3, 4, or 5, manual initiation of a reactor trip does not have to be OPERABLE if the CRD System is not capable of withdrawing the shutdown rods or control rods. If the rods cannot be withdrawn from the core, there is no need to be able to trip the reactor because all of the rods are inserted. In MODE 6, neither the shutdown rods nor the control rods are permitted to be withdrawn and the CRDMs are disconnected from the control rods and shutdown rods. Therefore, the manual initiation Function is not required.

2. Power Range Neutron Flux

The NIS power range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS power range detectors provide input to the Rod Control System and the Steam Generator (SG) Water Level Control System. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. Note that this Function also provides a signal to prevent automatic and manual rod withdrawal prior to initiating a reactor trip. Limiting further rod withdrawal may terminate the transient and eliminate the need to trip the reactor.

a. Power Range Neutron Flux—High

The Power Range Neutron Flux—High trip Function ensures that protection is provided, from all power levels, against a positive reactivity excursion leading to DNB during power operations. These can be caused by rod withdrawal or reductions in RCS temperature.

The LCO requires all four of the Power Range Neutron Flux—High channels to be OPERABLE.

In MODE 1 or 2, when a positive reactivity excursion could occur, the Power Range Neutron Flux—High trip must be OPERABLE. This Function

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

6. The Bases section for ASA, LCO, and Applicability for Function 5 first paragraph makes minor wording changes. In the original submittal, the last sentence of the first paragraph stated, " Therefore, the functional capability at the specified Allowable Value..."

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

4. Intermediate Range Neutron Flux (continued)

Because this trip Function is important only during startup, there is generally no need to disable channels for testing while the Function is required to be OPERABLE. Therefore, a third channel is unnecessary.

In MODE 1 below the P-10 setpoint, and in MODE 2 above the P-6 setpoint, when there is a potential for an uncontrolled RCCA bank rod withdrawal accident during reactor startup, the Intermediate Range Neutron Flux trip must be OPERABLE. Above the P-10 setpoint, the Power Range Neutron Flux–High Setpoint trip and the Power Range Neutron Flux–High Positive Rate trip provide core protection for a rod withdrawal accident. In MODE 2 below the P-6 setpoint, the Source Range Neutron Flux Trip provides the core protection for reactivity accidents. In MODE 3, 4, or 5, the Intermediate Range Neutron Flux trip does not have to be OPERABLE because Source Range Instrumentation channels provide the required reactor trip protection. The core also has the required SDM to mitigate the consequences of a positive reactivity addition accident. In MODE 6, all rods are fully inserted and the core has a required increased SDM. Also, the NIS intermediate range detectors cannot detect neutron levels present in this MODE.

5. Source Range Neutron Flux

The LCO requirement for the Source Range Neutron Flux trip Function ensures that protection is provided against an uncontrolled RCCA bank rod withdrawal accident from a subcritical condition during startup. This trip Function provides redundant protection to the Power Range Neutron Flux–Low trip Function. In MODES 3, 4, and 5, administrative controls also prevent the uncontrolled withdrawal of rods. The NIS source range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS source range detectors do not provide any inputs to control systems. The source range trip is the only RTS automatic protection function required in MODES 3, 4, and 5 when rods are capable of withdrawal or one or more rods are not fully inserted. Therefore, the functional capability at the trip setpoint is assumed to be available. |R5

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5. Source Range Neutron Flux (continued)

the Power Range Neutron Flux—Low Setpoint and Intermediate Range Neutron Flux trip Functions. In MODES 3, 4, and 5, administrative controls also prevent the uncontrolled withdrawal of rods. The NIS source range detectors are located external to the reactor vessel and measure neutrons leaking from the core. The NIS source range detectors do not provide any inputs to control systems. The source range trip is the only RTS automatic protection function required in MODES 3, 4, and 5. Therefore, the functional capability at the specified trip Setpoint is assumed to be available.

TSTF 135

<INSERT 1> TSTF 135

⑨ | R5

The LCO requires two channels of Source Range Neutron Flux to be OPERABLE. Two OPERABLE channels are sufficient to ensure no single random failure will disable this trip Function. The LCO also requires one channel of the Source Range Neutron Flux to be OPERABLE in MODE 3, 4, or 5 with RTBs open. In this case, the source range Function is to provide control room indication and input to the Boron Dilution Protection System (BDPS). The outputs of the Function to RTS logic are not required OPERABLE when the RTBs are open.

TSTF 135

The Source Range Neutron Flux Function provides protection for control rod withdrawal from subcritical, boron dilution and control rod ejection events. The Function also provides visual neutron flux indication in the control room.

<INSERT 2>

In MODE 2 when below the P-6 setpoint during a reactor startup, the Source Range Neutron Flux trip must be OPERABLE. Above the P-6 setpoint, the Intermediate Range Neutron Flux trip and the Power Range Neutron Flux—Low Setpoint trip will provide core protection for reactivity accidents. Above the P-6 setpoint, the NIS source range detectors are de-energized and inoperable.

TSTF 135

⑤

<INSERT 3>

In MODE 3, 4, and 5 with the reactor shut down, the Source Range Neutron Flux trip Function must also be OPERABLE. If the CRD System is capable of rod withdrawal, the Source Range Neutron Flux trip must be

TSTF 135

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

7. Bases section for ASA, LCO, and Applicability for Function 11 headings for single and two loop discussions are removed to be consistent with TSTF – 135 changes.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

11. Reactor Coolant Pump (RCP) Breaker Position

Both RCP Breaker Position trip Functions operate from three pairs of auxiliary contacts, with one pair on each RCP breaker with one contact supplying each train. These Functions anticipate the Reactor Coolant Flow–Low trips to avoid RCS heatup that would occur before the low flow trip actuates.

The RCP Breaker Position (Single Loop) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in one RCS loop. The position of each RCP breaker is monitored. If one RCP breaker is open above the P-8 setpoint, a reactor trip is initiated. This trip Function will generate a reactor trip before the Reactor Coolant Flow–Low (Single Loop) trip setpoint is reached. R5

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this trip Function because the RCS Flow–Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of a pump.

This Function measures only the discrete position (open or closed) of the RCP breaker. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-8 setpoint, when a loss of flow in any RCS loop could result in DNB conditions in the core, the RCP Breaker Position (Single Loop) trip must be OPERABLE. In MODE 1 below the P-8 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip because of the lower power level and the greater margin to the design limit DNBR.

The RCP Breaker Position (Two Loops) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. The position of each RCP breaker is monitored. Above the P-7 setpoint and below the P-8 setpoint, a loss of flow in two or more loops will initiate a reactor

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

11. Reactor Coolant Pump (RCP) Breaker Position (continued)

trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow–Low (Two Loops) trip setpoint is reached. R5

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this Function because the RCS Flow–Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of an RCP.

This Function measures only the discrete position (open or closed) of the RCP breaker. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-7 setpoint and below the P-8 setpoint, the RCP Breaker Position (Two Loops) trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on loss of flow in two RCS loops is automatically enabled. Above the P-8 setpoint, a loss of flow in any one loop will actuate a reactor trip because of the higher power level and the reduced margin to the design limit DNBR.

12. Undervoltage Reactor Coolant Pumps

The Undervoltage RCPs reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. The voltage to each RCP bus is monitored. Above the P-7 setpoint, a loss of voltage detected on two or more RCP buses will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow–Low (Two Loops) trip setpoint is reached. Time delays are incorporated into the Undervoltage RCPs channels to prevent reactor trips due to momentary electrical power transients.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

11. Reactor Coolant Pump (RCP) Breaker Position

Both RCP Breaker Position trip Functions operate together on two sets of auxiliary contacts, with one set on each RCP breaker. These Functions anticipate the Reactor Coolant Flow—Low trips to avoid RCS heatup that would occur before the low flow trip actuates.

a. Reactor Coolant Pump Breaker Position (Single Loop)

The RCP Breaker Position (Single Loop) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in one RCS loop. The position of each RCP breaker is monitored. If one RCP breaker is open above the P-8 setpoint, a reactor trip is initiated. This trip Function will generate a reactor trip before the Reactor Coolant Flow—Low (Single Loop) trip setpoint is reached.

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this trip Function because the RCS Flow—Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of a pump.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS.

In MODE 1 above the P-8 setpoint, when a loss of flow in any RCS loop could result in DNB conditions in the core, the RCP Breaker Position (Single Loop) trip must be OPERABLE. In MODE 1 below the P-8 setpoint, a loss of flow in two or more loops is required to actuate a reactor trip because of the lower power level and the greater margin to the design limit DNBR.

(continued)

Rev 5

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

b. Reactor Coolant Pump Breaker Position (Two Loops) | R5

The RCP Breaker Position (Two Loops) trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops. The position of each RCP breaker is monitored. Above the P-7 setpoint and below the P-8 setpoint, a loss of flow in two or more loops will initiate a reactor trip. This trip Function will generate a reactor trip before the Reactor Coolant Flow—Low (Two Loops) trip setpoint is reached. (9)

The LCO requires one RCP Breaker Position channel per RCP to be OPERABLE. One OPERABLE channel is sufficient for this Function because the RCS Flow—Low trip alone provides sufficient protection of unit SLs for loss of flow events. The RCP Breaker Position trip serves only to anticipate the low flow trip, minimizing the thermal transient associated with loss of an RCP.

This Function measures only the discrete position (open or closed) of the RCP breaker, using a position switch. Therefore, the Function has no adjustable trip setpoint with which to associate an LSSS. (2)

In MODE 1 above the P-7 setpoint and below the P-8 setpoint, the RCP Breaker Position (Two Loops) trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of flow are automatically blocked since no conceivable power distributions could occur that would cause a DNB concern at this low power level. Above the P-7 setpoint, the reactor trip on loss of flow in two RCS loops is automatically enabled. Above the P-8 setpoint, a loss of flow in any one loop will actuate a reactor trip because of the higher power level and the reduced margin to the design limit DNBR.

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

8. Bases section for ASA, LCO, and Applicability for Function 16 adds a discussion of the interface of auto stop oil with the Turbine EHC system.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

15. Steam Generator Water Level–Low, Coincident With Steam Flow/Feedwater Flow Mismatch (continued)

channels and two Steam Flow/Feedwater Flow Mismatch channels per SG. One narrow range level channel sensing a low level coincident with one Steam Flow/Feedwater Flow Mismatch channel sensing flow mismatch (steam flow greater than feed flow) will actuate a reactor trip.

The LCO requires two channels of SG Water Level–Low coincident with Steam Flow/Feedwater Flow Mismatch.

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level–Low coincident with Steam Flow/Feedwater Flow Mismatch trip must be OPERABLE. The normal source of water for the SGs is the MFW System (not safety related). The AFW System is the safety related backup source of water to ensure that the SGs remain the heat sink for the reactor. In MODE 3, 4, 5, or 6, the SG Water Level–Low coincident with Steam Flow/Feedwater Flow Mismatch Function does not have to be OPERABLE because the reactor is not operating or even critical. Decay heat removal is normally accomplished by Main Feedwater System or AFW System in MODE 3 and by the RHR System in MODE 4, 5, or 6.

16. Turbine Trip

a. Turbine Trip–Low Auto Stop Oil Pressure

The Turbine Trip–Low Auto Stop Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-8 setpoint, approximately 30% power, will not actuate a reactor trip. Three pressure switches monitor the Auto Stop oil pressure which interfaces with the Turbine Electrohydraulic Control System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip. These pressure switches do not provide any input to the turbine control system. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the

R5

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

15. Steam Generator Water Level—Low, Coincident With Steam Flow/Feedwater Flow Mismatch (continued)

or 6, the SG Water Level—Low coincident with Steam Flow/Feedwater Flow Mismatch Function does not have to be OPERABLE because the MFW System is not in operation and the reactor is not operating or even critical. Decay heat removal is normally accomplished by the AFW System in MODE 3 and by the RHR System in MODE 4, 5, or 6. The MFW System is in operation only in MODE 1 or 2 and, therefore, this trip Function need only be OPERABLE in these MODES.

16. Turbine Trip

a. Turbine Trip—Low Fluid Oil Pressure

The Turbine Trip—Low Fluid Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-8 setpoint, approximately 50% power, will not actuate a reactor trip. Three pressure switches monitor the control oil pressure in the Turbine Electrohydraulic Control System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip. These pressure switches do not provide any input to the control system. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure—High trip Function and RCS integrity is ensured by the pressurizer safety valves.

The LCO requires three channels of Turbine Trip—Low Fluid Oil Pressure to be OPERABLE in MODE 1 above P-8.

Below the P-8 setpoint, a turbine trip does not actuate a reactor trip. In MODE 2, 3, 4, 5, or 6, there is no potential for a turbine trip.

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

9. Bases section for ASA, LCO, and Applicability for Function 18 part b for P-7 makes minor wording changes.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

18. Reactor Trip System Interlocks (continued)

b. Low Power Reactor Trips Block, P-7 (continued)

(2) (continued)

- Undervoltage RCPs; and
- Underfrequency RCPs.

Allowable Value is not applicable to the P-7 interlock because it is a logic Function and thus has no parameter with which to associate an LSSS. R5

The P-7 interlock is a logic Function with train and not channel identity. Therefore, the LCO requires one channel per train of Low Power Reactor Trips Block, P-7 interlock to be OPERABLE in MODE 1.

The low power trips are blocked below the P-7 setpoint and unblocked above the P-7 setpoint. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the interlock performs its Function when power level increases above 10% power, which is in MODE 1. R5

c. Power Range Neutron Flux, P-8

The Power Range Neutron Flux, P-8 interlock is actuated at approximately 30% power as determined by two-out-of-four NIS power range detectors. The P-8 interlock automatically enables the Reactor Coolant Flow–Low and RCP Breaker Position (Single Loop) reactor trips on low flow in one or more RCS loops on increasing power. The LCO requirement for this Function ensures that the Turbine Trip–Low Auto Stop Oil Pressure and Turbine Trip–Turbine Stop Valve Closure reactor trips are enabled above the P-8 setpoint. Above the P-8 setpoint, a turbine trip will cause a load rejection beyond the capacity of the Steam Dump System. A reactor trip is automatically initiated on a turbine trip when it is above the P-8 setpoint, to minimize the transient on the reactor. The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in

(continued)

BASES

APPLICABLE SAFETY, ANALYSES, LCO, and APPLICABILITY

b. Low Power Reactor Trips Block, P-7 (continued)

- Pressurizer Water Level—High;
- Reactor Coolant Flow—Low (Two Loops); TSTF-169 | R5
- RCP Breaker Position (Two Loops); (low flow in two or more RCS loops)
- Undervoltage RCPs; and
- Underfrequency RCPs.

(15) Trip Setpoint and Allowable Value are not applicable to the P-7 interlock because it is a logic Function and thus has no parameter with which to associate an LSSS. (9) | R5

The P-7 interlock is a logic Function with train and not channel identity. Therefore, the LCO requires one channel per train of Low Power Reactor Trips Block, P-7 interlock to be OPERABLE in MODE 1.

The low power trips are blocked below the P-7 setpoint and unblocked above the P-7 setpoint. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the interlock performs its Function when power level drops below 10% power, which is in MODE 1. (increases above) (3) | R5

c. Power Range Neutron Flux, P-8

The Power Range Neutron Flux, (30) P-8 interlock is actuated at approximately 48% power as determined by two-out-of-four NIS power range detectors. (15) The P-8 interlock automatically enables the Reactor Coolant Flow—Low (Single Loop) and RCP Breaker Position (Single Loop) reactor trips on low flow in one or more RCS loops on increasing power. TSTF 169 | R5 <INSERT> (15) The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in the core when greater than approximately 48% (30) power. On decreasing (15)

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

10. Bases section for Action D fourth paragraph makes minor wording changes.

BASES

ACTIONS

D.1.1, D.1.2, D.2.1, D.2.2, and D.3 (continued)

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 72 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels ≥ 75% RTP. The 72 hour Completion Time and the 12 hour Frequency are consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)" for the long term monitoring requirement. [R5]

As an alternative to the above Actions, the unit may be placed in a MODE where this Function is no longer required OPERABLE. Seventy-eight hours are allowed to place the unit in MODE 3. This is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging unit systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypass condition for up to 12 hours while performing routine surveillance testing of other channels. The Note also allows placing the inoperable channel in the bypass condition to allow setpoint adjustments of other channels when required to reduce the setpoint in accordance with other Technical Specifications. The 12 hour time limit is justified in Reference 7.

Required Action D.2.2 has been modified by a Note which only requires SR 3.2.4.2 to be performed if the Power Range Neutron Flux input to QPTR becomes inoperable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. As such, determining QPTR using the movable incore detectors once per 12 hours may not be necessary.

E.1 and E.2

Condition E applies to the following reactor trip Functions:

- Power Range Neutron Flux–Low;
- Overtemperature ΔT;

(continued)

BASES

ACTIONS

D.1.1, D.1.2, D.2.1, D.2.2, and D.3 (continued)

limits. With one of the NIS power range detectors inoperable, 1/4 of the radial power distribution monitoring capability is lost.

As an alternative to the above actions, the inoperable channel can be placed in the tripped condition within 72 hours and the QPTR monitored once every 12 hours as per SR 3.2.4.2, QPTR verification. Calculating QPTR every 12 hours compensates for the lost monitoring capability due to the inoperable NIS power range channel and allows continued unit operation at power levels ≥ 75% RTP. The 72 hour Completion Time and the 12 hour Frequency are consistent with LCO 3.2.4, "QUADRANT POWER TILT RATIO (QPTR)." for the long term monitoring requirement

As an alternative to the above Actions, the plant may be placed in a MODE where this Function is no longer required OPERABLE. Seventy eight twelve hours are allowed to place the plant in MODE 3. This is a reasonable time, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems. If Required Actions cannot be completed within their allowed Completion Times, LCO 3.0.3 must be entered.

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypass condition for up to 12 hours while performing routine surveillance testing of other channels. The Note also allows placing the inoperable channel in the bypass condition to allow setpoint adjustments of other channels when required to reduce the setpoint in accordance with other Technical Specifications. The 12 hour time limit is justified in Reference 7.

Required Action D.2.2 has been modified by a Note which only requires SR 3.2.4.2 to be performed if the Power Range Neutron Flux input to QPTR becomes inoperable. Failure of a component in the Power Range Neutron Flux Channel which renders the High Flux Trip Function inoperable may not affect the capability to monitor QPTR. As such, determining QPTR using this movable incore detectors once per 12 hours may not be necessary. the

(continued)

Rw 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

11. Bases section for Action L in the first and third paragraphs adds a discussion of a plant specific risk assessment.

BASES

ACTIONS

K.1 and K.2 (continued)

based on operating experience in performing the Required Actions and the knowledge that unit conditions will change slowly.

Required Action K is modified by a Note which permits unit temperature changes provided the temperature change is accounted for in the calculated SDM. Introduction of temperature changes, including temperature increases when a positive MTC exists, must be evaluated to ensure they do not result in a loss of required SDM.

L.1 and L.2

Condition L applies to the following reactor trip Functions:

- Pressurizer Pressure–Low;
- Pressurizer Water Level–High;
- Reactor Coolant Flow–Low (Two Loops);
- RCP Breaker Position (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

With one channel inoperable, the inoperable channel must be placed in the tripped condition within 72 hours. For the Pressurizer Pressure–Low, Pressurizer Water Level–High, Undervoltage RCPs, and Underfrequency RCPs trip Functions, placing the channel in the tripped condition when above the P-7 setpoint results in a partial trip condition requiring only one additional channel to initiate a reactor trip. For the Reactor Coolant Flow–Low and RCP Breaker Position (Two Loops) trip Functions, placing the channel in the tripped condition results in a partial trip condition requiring only one additional channel in the same loop to initiate a reactor trip. For the latter two trip Functions, two tripped channels in two RCS loops are required to initiate a reactor trip when below the P-8 setpoint and above the P-7 setpoint. These Functions do not have to be OPERABLE below the P-7 setpoint because there are no loss of flow trips below the P-7 setpoint. There is insufficient heat production to generate DNB conditions below the P-7 setpoint. With the R5

(continued)

BASES

ACTIONS

L.1 and L.2 (continued)

exception of RCP Breaker Position, the 72 hours allowed to place the channel in the tripped condition is justified in Reference 7. A plant-specific risk assessment, consistent with Reference 7, was performed to justify the 72 hour Completion Time for RCP Breaker Position. An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time. R5 R5

Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant OPERABLE channel, and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition K.

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. With the exception of RCP Breaker Position, the 12 hour time limit is justified in Reference 7. A plant-specific risk assessment, consistent with Reference 7, was performed to justify the 12 hour time limit for RCP Breaker Position. R5

M.1 and M.2

Condition M applies to the RCP Breaker Position (Single Loop) reactor trip Function. There is one breaker position device per RCP breaker. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 72 hours. If the channel cannot be restored to OPERABLE status within the 72 hours, then THERMAL POWER must be reduced below the P-7 setpoint within the next 6 hours.

This places the unit in a MODE where the LCO is no longer applicable. This Function does not have to be OPERABLE below the P-7 setpoint because other RTS Functions provide core protection below the P-8 setpoint. The 72 hours allowed to restore the channel to OPERABLE status and the 6 additional hours allowed to reduce THERMAL POWER to below the P-7 setpoint are justified in Reference 7.

(continued)

BASES

ACTIONS

K.1, K.2, and L.3 (continued)

sufficient time to perform the calculations and determine that the SDM requirements are met. The SDM must also be verified once per 12 hours thereafter to ensure that the core reactivity has not changed. Required Action K.1 precludes any positive reactivity additions; therefore, core reactivity should not be increasing, and a 12 hour Frequency is adequate. The Completion Times of within 1 hour and once per 12 hours are based on operating experience in performing the Required Actions and the knowledge that unit conditions will change slowly.

<INSERT 1>

M.1 and M.2

Condition M applies to the following reactor trip Functions:

- Pressurizer Pressure—Low;
- Pressurizer Water Level—High;
- Reactor Coolant Flow—Low (Two Loops);
- RCP Breaker Position (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

With one channel inoperable, the inoperable channel must be placed in the tripped condition within 6 hours. Placing the channel in the tripped condition results in a partial trip condition requiring only one additional channel to initiate a reactor trip above the P-7 setpoint and below the P-8 setpoint. These Functions do not have to be OPERABLE below the P-7 setpoint because there are no loss of flow trips below the P-7 setpoint. The 6 hours allowed to place the channel in the tripped condition is justified in Reference 7. An additional 6 hours is allowed to reduce THERMAL POWER to below P-7 if the inoperable channel cannot be restored to OPERABLE status or placed in trip within the specified Completion Time.

<INSERT 2> <INSERT 3> <INSERT 4> <INSERT 5> <INSERT 6>

Allowance of this time interval takes into consideration the redundant capability provided by the remaining redundant

(continued)

Rev 5

INSERT 1

Required Action K is modified by a Note which permits unit temperature changes provided the temperature change is accounted for in the calculated SDM. Introduction of temperature changes, including temperature increases when a positive MTC exists, must be evaluated to ensure they do not result in a loss of required SDM.

INSERT 2

For the Pressurizer Pressure – Low, Pressurizer Water Level – High, Undervoltage RCPs, and Underfrequency RCPs trip Functions, placing the channel into the tripped condition when above the P-7 setpoint results in a partial trip condition requiring only one additional channel to initiate a reactor trip. For the Reactor Coolant Flow – Low and RCP Breaker Position (Two Loops) trip Function, placing the

INSERT 3

For the latter two trip Functions, two tripped channels in two RCS loops are required to initiate a reactor trip when below the P-8 setpoint and above the P-7 setpoint.

INSERT 4

There is insufficient heat production to generate DNB conditions below the P-7 setpoint.

INSERT 5

With the exception of RCP Breaker Position,

R5

INSERT 6

A plant – specific risk assessment, consistent with Reference 7, was performed to justify the 72 hour Completion Time for RCP Breaker Position.

BASES

ACTIONS

L.1 and L.2 (continued)

OPERABLE channel, and the low probability of occurrence of an event during this period that may require the protection afforded by the Functions associated with Condition M. TSTF 135

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of the other channels. The 12 hour time limit is justified in Reference 7. <INSERT 1> <INSERT 2> 2 R5

N.1 and N.2

Condition N applies to the Reactor Coolant Flow—Low (Single Loop) reactor trip Function. With one channel inoperable, the inoperable channel must be placed in trip within 6 hours. If the channel cannot be restored to OPERABLE status or the channel placed in trip within the 6 hours, then THERMAL POWER must be reduced below the P-8 setpoint within the next 4 hours. This places the unit in a MODE where the LCO is no longer applicable. This trip Function does not have to be OPERABLE below the P-8 setpoint because other RTS trip Functions provide core protection below the P-8 setpoint. The 6 hours allowed to restore the channel to OPERABLE status or place in trip and the 4 additional hours allowed to reduce THERMAL POWER to below the P-8 setpoint are justified in Reference 7. TSTF 169

The Required Actions have been modified by a Note that allows placing the inoperable channel in the bypassed condition for up to 4 hours while performing routine surveillance testing of the other channels. The 4 hour time limit is justified in Reference 7.

M.1 and M.2 TSTF 169 & 135

Condition M applies to the RCP Breaker Position (Single Loop) reactor trip Function. There is one breaker position device per RCP breaker. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 72 hours. If the channel cannot be restored to OPERABLE status within the 72 hours, then THERMAL POWER must be reduced below the P-7 setpoint within the next 6 hours. 9

(continued)

INSERT 1

With the exception of RCP Breaker Position,

INSERT 2

A plant – specific risk assessment, consistent with Reference 7, was performed to justify the 12 hour time limit for RCP Breaker Position.

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

12. Bases section for SR 3.3.1.4 in the second paragraph makes minor wording changes.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

clarifies that the Surveillance is required only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP.

The Frequency of every 31 EFPD is adequate. It is based on unit operating experience, considering instrument reliability and operating history data for instrument drift. Also, the slow changes in neutron flux during the fuel cycle can be detected during this interval.

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT every 31 days on a STAGGERED TEST BASIS. This test shall verify OPERABILITY by actuation of the end devices. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test is a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker. The local manual shunt trip of the RTB bypass shall be conducted immediately after placing the bypass breaker into service. This test must be conducted prior to the start of testing of the RTS or RTB maintenance. This checks the mechanical operation of the bypass breaker. |R5 |R5

The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4

SR 3.3.1.4 is the performance of a TADOT every 31 days on a STAGGERED TEST BASIS. This test shall verify OPERABILITY by actuation of the end devices. <INSERT 1> TSTF 205

The RTB test shall include separate verification of the undervoltage and shunt trip mechanisms. Independent verification of RTB undervoltage and shunt trip Function is not required for the bypass breakers. No capability is provided for performing such a test at power. The independent test for bypass breakers is included in SR 3.3.1.14. The bypass breaker test shall include a local shunt trip. A Note has been added to indicate that this test must be performed on the bypass breaker prior to placing it in service. <INSERT 2>

(5) (9) RS

The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data.

SR 3.3.1.5

SR 3.3.1.5 is the performance of an ACTUATION LOGIC TEST. The SSPS is tested every 31 days on a STAGGERED TEST BASIS, using the semiautomatic tester. The train being tested is placed in the bypass condition, thus preventing inadvertent actuation. Through the semiautomatic tester, all possible logic combinations, with and without applicable permissives, are tested for each protection function. The Frequency of every 31 days on a STAGGERED TEST BASIS is adequate. It is based on industry operating experience, considering instrument reliability and operating history data. <INSERT 3>

(9) RS

SR 3.3.1.6

(9)

SR 3.3.1.6 is a comparison calibration of the excore channels to the incore channels. If the measurements do not agree, the excore channels are not declared inoperable but must be calibrated to agree with the incore detector measurements. If the excore channels cannot be adjusted, the channels are declared inoperable. This Surveillance is performed to verify the f(ΔI) input to the overtemperature ΔT Function.

(continued)

Rev 5

INSERT 1

A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

INSERT 2

The local manual shunt trip of the RTB bypass shall be conducted immediately after placing the bypass breaker into service. This test must be conducted prior to the start of testing of the RTS or RTB maintenance.

R5

INSERT 3

, including operation of the P-7 permissive which is a logic function only.

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

13. Bases section for SR 3.3.1.8 in the second paragraph deletes the last sentence. This sentence stated, "The performance of this SR is not required if it has been performed within the 92-day frequency with the unit operating above the MODE of applicability for the Source Range, Intermediate Range, and Power Range (Low Setpoint) functions." This sentence is redundant and not necessary.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "12 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the unit remains in the MODE of Applicability after the initial performances of prior to reactor startup and twelve and four hours after reducing power below P-10 or P-6, respectively. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than 12 hours or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the time limit.

Twelve hours and four hours are reasonable times to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 12 and 4 hours, respectively. Verification of the surveillance is accomplished by observing the permissive annunciator windows on the Main Control board. |R5

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by |R5

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 92 days of the Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods >4 hours.

INSERT 1 (TSTF 205, RAI 3.3.1-31, 3.3.1-33, R5)

INSERT 2 (TSTF 242, R5)

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7.

INSERT 3 (TSTF 205, R5)

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

14. Bases section for SR 3.3.1.9 in the first paragraph deletes the second sentence. This sentence stated, "This Surveillance is required to be performed on Unit 2 only."

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.8 (continued)

Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "12 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the unit remains in the MODE of Applicability after the initial performances of prior to reactor startup and twelve and four hours after reducing power below P-10 or P-6, respectively. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 for more than 12 hours or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the time limit.

Twelve hours and four hours are reasonable times to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 12 and 4 hours, respectively. Verification of the surveillance is accomplished by observing the permissive annunciator windows on the Main Control board. |R5

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by |R5

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.8

SR 3.3.1.8 is the performance of a COT as described in SR 3.3.1.7, except it is modified by a Note that this test shall include verification that the P-6 and P-10 interlocks are in their required state for the existing unit condition. The Frequency is modified by a Note that allows this surveillance to be satisfied if it has been performed within 92 days of the Frequencies prior to reactor startup and four hours after reducing power below P-10 and P-6. The Frequency of "prior to startup" ensures this surveillance is performed prior to critical operations and applies to the source, intermediate and power range low instrument channels. The Frequency of "4 hours after reducing power below P-10" (applicable to intermediate and power range low channels) and "4 hours after reducing power below P-6" (applicable to source range channels) allows a normal shutdown to be completed and the unit removed from the MODE of Applicability for this surveillance without a delay to perform the testing required by this surveillance. The Frequency of every 92 days thereafter applies if the plant remains in the MODE of Applicability after the initial performances of prior to reactor startup and four hours after reducing power below P-10 or P-6. The MODE of Applicability for this surveillance is < P-10 for the power range low and intermediate range channels and < P-6 for the source range channels. Once the unit is in MODE 3, this surveillance is no longer required. If power is to be maintained < P-10 or < P-6 for more than 4 hours, then the testing required by this surveillance must be performed prior to the expiration of the 4 hour limit. Four hours is a reasonable time to complete the required testing or place the unit in a MODE where this surveillance is no longer required. This test ensures that the NIS source, intermediate, and power range low channels are OPERABLE prior to taking the reactor critical and after reducing power into the applicable MODE (< P-10 or < P-6) for periods > 4 hours.

INSERT 1 > TSTF 205 | 1 | RAI 3.3.1-31 3.3.1-33 R5

31 | 12 | TSTF 242 | 2 | unit | twelve and | respectively | for more than 12 hours | time | 18 | are | Twelve hours and | 12 and | respectively | INSERT 2 > 5 | R5

SR 3.3.1.9

SR 3.3.1.9 is the performance of a TADOT and is performed every 92 days, as justified in Reference 7.

TSTF 205 | 1 | INSERT 3 > | R5

(continued)

Rev 5

INSERT 1

A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

INSERT 2

Verification of the SR is accomplished by observing the permissive annunciator windows of the Main Control board.

INSERT 3

(Not used.)

R5

INSERT 4

(Not used.)

INSERT 5

A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

15. Bases section for SR 3.3.1.12 in the second paragraph changes the "rate lag compensation" to "dynamic compensation." This is required because the SR verifies OTΔT and OPΔT functions. One function has a "rate lead" compensation correction, while the other has a "rate lag" compensation correction. "Dynamic compensation" provides an accurate description for these compensation factors.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.11 (continued)

This Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1, and is not required for the NIS intermediate range detectors for entry into MODE 2, because the unit must be in at least MODE 2 to perform the test for the intermediate range detectors and MODE 1 for the power range detectors. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

SR 3.3.1.12

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detector (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

This test will verify the dynamic compensation for flow from the core to the RTDs. |R5

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every 18 months. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL OPERATIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.11 (continued)

plateau or preamp discriminator curves, evaluating those curves, and comparing the curves to the manufacturer's data. This Surveillance is not required for the NIS power range detectors for entry into MODE 2 or 1, and is not required for the NIS intermediate range detectors for entry into MODE 2, because the unit must be in at least MODE 2 to perform the test for the intermediate range detectors and MODE 1 for the power range detectors. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed on the 18 month Frequency.

(1) (unit) (2) (1)

SR 3.3.1.12

<INSERT1> TSTF 19

SR 3.3.1.12 is the performance of a CHANNEL CALIBRATION, as described in SR 3.3.1.10, every 18 months. This SR is modified by a Note stating that this test shall include verification of the RCS resistance temperature detector (RTD) bypass loop flow rate.

(1) (6) (3) /RS

dynamic rate lag compensation for flow from the core to the RTDs.

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

SR 3.3.1.13

SR 3.3.1.13 is the performance of a COT of RTS interlocks every 18 months.

TSTF 205 (1) <INSERT2>

The Frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

16. Bases section for SR 3.3.1.14 in the first paragraph makes minor wording changes.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.13 (continued)

The Frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, RCP Breaker Position, and the SI Input from ESFAS. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This TADOT is performed every 18 months. The test shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function for the Reactor Trip Breakers and undervoltage trip circuits for the Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip. R5

The Frequency is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. This TADOT is performed prior to exceeding the P-8 interlock whenever the

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.14

SR 3.3.1.14 is the performance of a TADOT of the Manual Reactor Trip, RCP Breaker Position, and the SI Input from ESFAS. This TADOT is performed every [18] months. The test shall independently verify the OPERABILITY of the undervoltage and shunt trip mechanisms for the Manual Reactor Trip Function for the Reactor Trip Breakers and Reactor Trip Bypass Breakers. The Reactor Trip Bypass Breaker test shall include testing of the automatic undervoltage trip.

TSTF 205 (1) <INSERT1> (2) CIRCUITS | undervoltage trip circuits for the (2) | R5

The Frequency is based on the known reliability of the Functions and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

The SR is modified by a Note that excludes verification of setpoints from the TADOT. The Functions affected have no setpoints associated with them.

SR 3.3.1.15

SR 3.3.1.15 is the performance of a TADOT of Turbine Trip Functions. This TADOT is as described in SR 3.3.1.4, except that this test is performed prior to reactor startup. A Note states that this Surveillance is not required if it has been performed within the previous 31 days. Verification of the trip setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to taking the reactor critical. This test cannot be performed with the reactor at power and must therefore be performed prior to reactor startup.

TSTF 205 <INSERT> (2) <INSERT 2> TSTF 311 (9) exceeding the P-8 interlock TSTF 311

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Technical Requirements Manual, Section 15 (Ref. 8). Individual component response times are not modeled in the analyses.

(4) (2)

(continued)

Rev 5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

17. Bases section for SR 3.3.1.16 third paragraph states, " . . . with the resulting measured response time compared to the appropriate UFSAR response time." This is incorrect and should state, " . . . TRM response time."

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.15 (continued)

unit has been in MODE 3. This Surveillance is not required if it has been performed within the previous 31 days. Verification of the trip setpoint does not have to be performed for this Surveillance. Performance of this test will ensure that the turbine trip Function is OPERABLE prior to exceeding the P-8 interlock.

SR 3.3.1.16

SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Response time testing acceptance criteria are included in Technical Requirements Manual (Ref. 8). Individual component response times are not modeled in the analyses.

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state (i.e., control and shutdown rods fully inserted in the reactor core).

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, with the resulting measured response time compared to the appropriate TRM response time. Alternately, the response time test can be performed with the time constants set to their nominal value, provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured. |R5

As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

The analyses model the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state (i.e., control and shutdown rods fully inserted in the reactor core).

For channels that include dynamic transfer Functions (e.g., lag, lead/lag, rate/lag, etc.), the response time test may be performed with the transfer Function set to one, with the resulting measured response time compared to the appropriate response time. Alternately, the response time test can be performed with the time constants set to their nominal value, provided the required response time is analytically calculated assuming the time constants are set at their nominal values. The response time may be measured by a series of overlapping tests such that the entire response time is measured.

As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS. Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times. Experience has shown that these components usually pass this surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. <INSERT> Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 6.
3. FSAR, Chapter 15.
4. IEEE-279-1971.

(continued)

Rev.0

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

18. Bases section for References states, "WCAP-10271-P-A Supplement 2, Rev.1, June 1990," is for the RTS. This should state "Supplement 1."

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Response of neutron flux signal portion of the channel time shall be measured from the detector or input of the first electronic component in the channel. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. UFSAR, Chapter 7.

2. UFSAR, Chapter 6.

3. UFSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. RTS/ESFAS Setpoint Methodology Study (Technical Reports EE-0101 and EE-0116). R5

7. WCAP-10271-P-A, Supplement 1, Rev. 1, June 1990 and WCAP-14333-P-A, Rev. 1, October 1998.

8. Technical Requirements Manual.

9. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."

BASES

R5

REFERENCES (continued)

5. 10 CFR 50.49.
6. RTS/ESFAS Setpoint Methodology Study, Technical Reports EE-0110 and EE-0116.3 (2)
7. WCAP-10271-P-A, Supplement (1) 2, Rev. 1, June 1990, and WCAP-14333-P-A Rev. 1, October 1998 (2)
8. Technical Requirements Manual, Section 15, "Response Times."

Rev 5

19. Reference section for number 6 states that technical report EE-0101 is the RTS/ESFAS Setpoint Methodology Study. This should state that "Technical Reports EE-0101 and EE0116."

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Response of neutron flux signal portion of the channel time shall be measured from the detector or input of the first electronic component in the channel. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

REFERENCES

1. UFSAR, Chapter 7.

2. UFSAR, Chapter 6.

3. UFSAR, Chapter 15.

4. IEEE-279-1971.

5. 10 CFR 50.49.

6. RTS/ESFAS Setpoint Methodology Study (Technical Reports EE-0101 and EE-0116). R5

7. WCAP-10271-P-A, Supplement 1, Rev. 1, June 1990 and WCAP-14333-P-A, Rev. 1, October 1998.

8. Technical Requirements Manual.

9. Regulatory Guide 1.105, Revision 3, "Setpoints for Safety Related Instrumentation."

BASES

REFERENCES (continued)

5. 10 CFR 50.49.

6. RTS/ESFAS Setpoint Methodology Study. (Technical Reports EE-0104 and EE-0116.)

7. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990. and WCAP-14333-P-A Rev. 1, October 1995

8. Technical Requirements Manual, Section 15, "Response Times."

R5

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

20. Various Bases sections NUREG –1431 markup corrections.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6. Overtemperature ΔT (continued)

NIS upper and lower power range detectors. If axial peaks are greater than the design limit, as indicated by the difference between the upper and lower NIS power range detectors, the Trip Setpoint is reduced in accordance with Note 1 of Table 3.3.1-1. (9)

Dynamic compensation is included for system piping delays from the core to the temperature measurement system.

The Overtemperature ΔT trip Function is calculated for each loop as described in Note 1 of Table 3.3.1-1. Trip occurs if Overtemperature ΔT is indicated in two loops. At some units, the pressure and temperature signals are used for other control functions. For those units, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. (3) Note that this Function also provides a signal to generate a turbine runback prior to reaching the Trip Setpoint. (9) A turbine runback will reduce turbine power and reactor power. A reduction in power will normally alleviate the Overtemperature ΔT condition and may prevent a reactor trip. (INSERT) (2) | R5

The LCO requires all four channels of the Overtemperature ΔT trip Function to be OPERABLE for two and four loop units (the LCO requires all three channels on the Overtemperature ΔT trip Function to be OPERABLE for three loop units). (2) (3) Note that the Overtemperature ΔT Function receives input from channels shared with other RTS Functions. Failures that affect multiple Functions require entry into the Conditions applicable to all affected Functions.

In MODE 1 or 2, the Overtemperature ΔT trip must be OPERABLE to prevent DNB. In MODE 3, 4, 5, or 6, this trip Function does not have to be OPERABLE because the reactor is not operating and there is insufficient heat production to be concerned about DNB.

(continued)

Rev 5

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

a. Intermediate Range Neutron Flux, P-6 (continued)

In MODE 3, 4, 5, or 6, the P-6 interlock does not have to be OPERABLE because the NIS Source Range is providing core protection.

b. Low Power Reactor Trips Block, P-7

The Low Power Reactor Trips Block, P-7 interlock is actuated by input from either the Power Range Neutron Flux, P-10, or the Turbine Impulse Pressure, P-13 interlock. The LCO requirement for the P-7 interlock ensures that the following Functions are performed:

(1) on increasing power, the P-7 interlock automatically enables reactor trips on the following Functions:

- Pressurizer Pressure—Low;
- Pressurizer Water Level—High;
- Reactor Coolant Flow—Low ~~(Two Loops)~~; TSTF 169 (Low flow in two or more RCS loops) R5
- RCPs Breaker Open (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

These reactor trips are only required when operating above the P-7 setpoint (approximately 10% power). The reactor trips provide protection against violating the DNBR limit. Below the P-7 setpoint, the RCS is capable of providing sufficient natural circulation without any RCP running.

(2) on decreasing power, the P-7 interlock automatically blocks reactor trips on the following Functions:

- Pressurizer Pressure—Low;

(continued)

Rev 5

BASES

APPLICABLE SAFETY, ANALYSES, LCO, and APPLICABILITY

b. Low Power Reactor Trips Block, P-7 (continued)

- Pressurizer Water Level—High;
- Reactor Coolant Flow—Low (Two Loops); TSTF-169 | R5
- RCP Breaker Position (Two Loops);
- Undervoltage RCPs; and
- Underfrequency RCPs.

(low flow in two or more RCS loops)

(15) (9) | R5

Trip Setpoint and Allowable Value are not applicable to the P-7 interlock because it is a logic Function and thus has no parameter with which to associate an LSSS.

The P-7 interlock is a logic Function with train and not channel identity. Therefore, the LCO requires one channel per train of Low Power Reactor Trips Block, P-7 interlock to be OPERABLE in MODE 1.

The low power trips are blocked below the P-7 setpoint and unblocked above the P-7 setpoint. In MODE 2, 3, 4, 5, or 6, this Function does not have to be OPERABLE because the interlock performs its Function when power level drops below 10% power, which is in MODE 1. | R5

c. Power Range Neutron Flux, P-8 (30)

The Power Range Neutron Flux, P-8 interlock is actuated at approximately 48% power as determined by two-out-of-four NIS power range detectors. The P-8 interlock automatically enables the Reactor Coolant Flow—Low (Single Loop) and RCP Breaker Position (Single Loop) reactor trips on low flow in one or more RCS loops on increasing power. The LCO requirement for this trip Function ensures that protection is provided against a loss of flow in any RCS loop that could result in DNB conditions in the core when greater than approximately 48% (30) power. On decreasing

(15) TSTF 169 | R5 (15) <INSERT> (15)

(continued)

Rev 5

BASES

ACTIONS

A.1 (continued)

at the same time. The Required Action is to refer to Table 3.3.1-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, B.2.1, and B.2.2

TSTF 135

Condition B applies to the Manual Reactor Trip in MODE 1 or 2. This action addresses the train orientation of the SSPS for this Function. With one channel inoperable, the inoperable channel must be restored to OPERABLE status within 48 hours. In this Condition, the remaining OPERABLE channel is adequate to perform the safety function.

The Completion Time of 48 hours is reasonable considering that there are two automatic actuation trains and another manual initiation channel OPERABLE, and the low probability of an event occurring during this interval.

If the Manual Reactor Trip Function cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 additional hours (54 hours total time). followed by opening the RTBs within 1 additional hour (55 hours total time). The 6 additional hours to reach MODE 3 and the 1 hour to open the RTBs are is reasonable, based on operating experience, to reach MODE 3 and open the RTBs from full power operation in an orderly manner and without challenging unit systems. With the RTBs open and the unit in MODE 3, this trip function is no longer required to be OPERABLE.

TSTF 135

<INSERT 1>

C.1 and C.2

Condition C applies to the following reactor trip Functions in MODE 3, 4, or 5 with the RTBs closed and the CRD System capable of rod withdrawal:

Rod Control

RS

<INSERT 2>

TSTF 135

(continued)

Rev 5

BASES

ACTIONS

C.1 and C.2 (continued)

- Manual Reactor Trip;
- RTBs;
- RTB Undervoltage and Shunt Trip Mechanisms; and
- Automatic Trip Logic.

This action addresses the train orientation of the SSPS for these Functions. With one channel or train inoperable, the inoperable channel or train must be restored to OPERABLE status within 48 hours. If the affected Function(s) cannot be restored to OPERABLE status within the allowed 48 hour Completion Time, the unit must be placed in a MODE in which the requirement does not apply. To achieve this status, the <INSERT 1> TSTF 135 RTBs must be opened within the next hour. The additional hour provides sufficient time to accomplish the action in an orderly manner. With the RTBs open, these Functions are no longer required. <INSERT 2>

The Completion Time is reasonable considering that in this Condition, the remaining OPERABLE train is adequate to perform the safety function, and given the low probability of an event occurring during this interval.

D.1.1, D.1.2, D.2.1, D.2.2, and D.3

Condition D applies to the Power Range Neutron Flux—High Function.

The NIS power range detectors provide input to the CRD System and the SG Water Level Control System and, therefore, have a two-out-of-four trip logic. A known inoperable channel must be placed in the tripped condition. This results in a partial trip condition requiring only one-out-of-three logic for actuation. The 72 hours allowed to place the inoperable channel in the tripped condition is justified in WCAP-10271-P-A (Ref. 7b). Rod Control TSTF 135 (9) (2) R5

In addition to placing the inoperable channel in the tripped condition, THERMAL POWER must be reduced to ≤ 75% RTP within 12 hours. Reducing the power level prevents operation of the core with radial power distributions beyond the design (9) 78

(continued)

Rev 5

BASES

ACTIONS I.1 (continued)

NIS source range performs the monitoring and protection functions. With both source range channels inoperable, the RTBs must be opened immediately. With the RTBs open, the core is in a more stable condition and the unit enters Condition J. TSTF135 | R5

J.1 and J.2

TSTF 135

Condition K applies to one inoperable source range channel in MODE 3, 4, or 5 with the RTBs closed and the CRD System capable of rod withdrawal. Rod Control

With the unit in this Condition, below P-6, the NIS source range performs the monitoring and protection functions. <INSERT 1> TSTF 135

With one of the source range channels inoperable, 48 hours is allowed to restore it to an OPERABLE status. If the channel cannot be returned to an OPERABLE status, 1 additional hour is allowed to open the RTBs. Once the RTBs are open, the core is in a more stable condition and the unit enters Condition L. <INSERT 2> | R5

The allowance of 48 hours to restore the channel to OPERABLE status, and the additional hour to open the RTBs, are justified in Reference 7. TSTF 135

K.1, K.2, and L.3 (9)

Condition K applies when the required number of OPERABLE Source Range Neutron Flux channels is not met in MODE 3, 4, or 5 with the RTBs open. <INSERT 3> (9) | R5

With the unit in this Condition, the NIS source range performs the monitoring and protection functions. (9)

With less than the required number of source range channels OPERABLE, operations only involving positive reactivity additions shall be suspended immediately. This will preclude any power escalation. TSTF 286

In addition to suspension of positive reactivity additions, all valves that could add unborated water to the RCS must be closed within 1 hour as specified in LCO 3.9.2. The isolation of unborated water sources will preclude a boron dilution accident. (9)

Also, the SDM must be verified within 1 hour and once every 12 hours thereafter as per SR 3.1.1.1, SDM verification. (3)

With no source range channels OPERABLE, core protection is severely reduced. Verifying the SDM within 1 hour allows the ability to monitor the core (3)

(continued)

Rev. 5

INSERT 1

or one or more rods are not fully inserted

INSERT 2

action must be initiated within the same 48 hours to ensure that all rods are fully inserted, and the Rod Control System must be placed in a condition incapable of rod withdrawal within the next hour.

R5

INSERT 3

Rod Control System is not capable of rod withdrawal

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

21. A correction to DOC LA.6.

The removal of these details, which are related to system design, from the Technical Specifications, is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the necessary SR to maintain the RTB and bypass RTBs OPERABLE. Also, this change is acceptable because the removed information will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because information relating to system design is being removed from the Technical Specifications.

RAI 3.3.1-26 R5

LA.5 *(Type 5 – Removal of Cycle-Specific Parameter Limits from the Technical Specifications to the Core Operating Limits Report)* CTS Table 2.2-1 for the Limiting Safety System Settings states the formulas for Overtemperature and Overpower ΔT functions. ITS 3.3.1 in Table 3.3.1 – 1 lists the formulas for the Overtemperature and Overpower ΔT functions with a reference in each that the specific variables are contained in the Core Operating Limits Report (COLR). This changes the CTS by relocating specific parameters for the Overtemperature and Overpower ΔT functions from the Technical Specifications to the COLR.

The removal of these cycle-specific parameter limits from the Technical Specifications and their relocation into the COLR is acceptable because these limits are developed or utilized under NRC-approved methodologies. The NRC documented in Generic Letter 88-16, Removal of Cycle-Specific Parameter Limits From the Technical Specifications, that this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains requirements and Surveillances that verify that the cycle-specific parameter limits are being met. The functional requirements of the Overtemperature and Overpower are retained in the Technical Specifications to ensure core protection. Also, this change is acceptable because the removed information will be adequately controlled in the COLR under the requirements provided in ITS 5.6.5, Core Operating Limits Report. ITS 5.6.5 ensures that the applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems limits, and nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met. This change is designated as a less restrictive removal of detail change because information relating to cycle-specific parameter limits is being removed from the Technical Specifications.

LA.6 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 3.3.1.1 Surveillance Requirement in Table 4.3-1 for the Intermediate Range channels requires a CHANNEL CHECK on a refueling basis, and shown by the designation of R [12]. Note 12 states, in part, "verification that the Permissives P-6 and P-10 are in their required state for existing plant conditions by

R5

observation of the permissive annunciator window." The requirement of verification for P-6 and P-10 is retained in ITS SR 3.3.1.8. This changes the CTS by moving the requirement of "observation of the permissive annunciator window," from the Specification to the ITS Bases.

The removal of these details for performing actions from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirements for the OPERABILITY of interlocks P-6 and P-10. The information about the interlocks does not provide a specific requirement for each function, but only describe the mechanics for the function verification. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications. RS

LA.7 *(Type 3 – Removing Procedural Details for Meeting TS Requirements and Related Reporting Problems)* CTS 2.2.1 Action states, "with the RTS instrumentation setpoint less conservative than the Allowable Value, the instrumentation channel must be declared inoperable." With the channels inoperable, the applicable Action of ITS 3.3.1.1 shall be entered, and the channel's trip setpoint shall be adjusted to be consistent with the Trip Setpoint value to return the instrument to OPERABLE status. The information provides no specific requirement for each function, but only describes the mechanics of how to adjust the channel to provide the required reactor protection. This changes the CTS by moving the information relating to the Trip Setpoint from the Specification to the ITS 3.3.1 Bases.

The removal of these details for performing actions from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. This descriptive information associated with the Trip Setpoints and Allowable Values for determining OPERABILITY is more appropriate for the Technical Specifications Bases. All necessary requirements for each function remain in the ITS Table 3.3.1-1. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

ITS AND BASES CHANGES NOT ASSOCIATED WITH RAI RESPONSES

22. A correction to DOC M.8.

ability of the operator to monitor reactor power level is significantly degraded with the required Source Range channel inoperable, therefore the additional limitation is acceptable to ensure that safety has not been adversely affected. This change is designated as more restrictive because the additional restrictions have been placed on the CTS requirements.

RAI 3.3.1-23 R5

M.7 CTS Table 4.3-1 lists the surveillance requirements of CHANNEL CALIBRATION for the Turbine Trip Function 18.A Auto Stop Oil Pressure and Function 18.B Turbine Stop Valves Closure as Not Applicable (N/A). ITS Table 3.3.1–1 Function 16 Turbine lists the CHANNEL CALIBRATION surveillance requirement for the Auto Stop Oil Pressure and Turbine Stop Valve Closure as SR 3.3.1.10. This must be performed at a Frequency of 18 months. This SR is modified by a Note that requires the verification that time constants are adjusted to prescribed values. This changes the CTS by adding a CHANNEL CALIBRATION requirement for the Turbine Trip functions.

RAI 3.3.1-24 R5

The purpose of ITS SR 3.3.1.10 is to ensure the channels are aligned to provide an accurate representation of the monitored function including any required time constants. This change is acceptable because the periodic verification of the Allowable Values is necessary to ensure the turbine will trip at the specified values. This change is designated as more restrictive because the current requirement for the Turbine Trip does not require periodic CHANNEL CALIBRATION verification.

M.8 CTS Table 4.3-1 contains a Surveillance Requirement for the Intermediate Range channels. A CHANNEL CALIBRATION is required and modified by a footnote. Note 13 states, "The provisions of Specification 4.0.4 are not applicable for entry in MODE 2 or 1." ITS SR 3.3.1.11 for the Intermediate Ranges requires a CHANNEL CALIBRATION every 18 months. This changes the CTS by deleting a portion of the Note allowing the Specification 4.0.4 allowance.

R5

This change is acceptable because the Specification 4.0.4 exception is not necessary because the Surveillance Requirement may be performed and evaluated without affecting the OPERABILITY of the instruments. This change is designated as more restrictive because an allowance of the CTS has been deleted in the ITS requirements.

M.9 Unit 1 CTS Table 4.3-1 Function 20, RCP Breaker Position Trip, lists N/A under the column labeled "MODES IN WHICH SURVEILLANCE REQUIRED." Function 20 requires a CHANNEL FUNCTIONAL TEST to be performed on an R (Refueling) frequency. Unit 2 CTS Table 4.3-1 Function 18, Turbine Trip on Low Auto Stop Oil Pressure and Turbine Stop Valve Closure, lists N/A under the "MODES IN WHICH SURVEILLANCE REQUIRED," column. Function 18 requires a CHANNEL FUNCTIONAL TEST to be performed for each portion of the function at a frequency of S/U (1). S/U requires the surveillance to be performed prior to each reactor start up. Note (1) states, "If not performed within the previous 31 days." The applicable MODES or other specified conditions for ITS Table 3.3.1-1 Function 11, RCP

RAI 3.3.1-01 R5